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NEWS IN BRIEF

National mini threat to DEC

THE direct challenge to Digital Equipment Corporation, expected for some time from National Semiconductor, has taken an important step nearer with the formal announcement by National of the Series 200, a family of microcomputers said to be totally software and I/O compatible with the DEC PDP-11 line.

But National still cannot say when Series 200 marketing will start in the US or Europe following its filing of a federal anti-trust suit against DEC over DEC's patents.

Groundless fears

FEARS that Doncaster law courts officials would be able to access personal information held on the local authority's machines have been described as groundless by the leader of the town council, Coun Les Adams. The local branch of the National Council for Civil Liberties had asked for a planned link between the courts and the council computer to be delayed. The link was proposed to help the courts clear off a backlog of administrative work.

Viewdata software

A VIEWDATA software suite for the Philips 8800 line of microcomputers has been developed by the company in Holland to give Philips the necessary expertise for a possible market entry in the future, but at present it is for internal use only. It will also enable Philips to take part in the growing debate on international viewdata standards.

Bankers' dual 2860

MERCHANT bankers Morgan Grenfell have decided to replace their ICL 1902T and 1903A mainframes with a three Megabyte dual 2860. The existing workload will run under DME+ while new systems are developed under VME/B using the IDMS system.

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£18,000 charity stroll

BAD weather did not dampen the enthusiasm for the 17th annual Begis Stroll last weekend in Manchester. The 65-mile walk was sponsored by Computer Weekly and the 3,000 entrants helped raise £18,000 for local charities. First back was Malcolm Blissett who completed the route in eight hours, followed by another 445 finishers arriving throughout the day. Several Cammadora Pets were located at checkpoints and linked to Modular One and CDC 7600 machines and were used to monitor progress.

More than 25,000 walker-transactions were processed during the walk. Pictured right are some of the walkers with their Computer Weekly banners.



Ops paralyse the Paymaster's office

CIVIL servants rocked the government boat again this week by pulling out 40 computer operations staff from the Paymaster General's Office in Crawley.

Members of the Society of Civil and Public Servants and the Civil and Public Servants Association taking part in strike action are adamant over their claim, and this latest blow to the government must come as a shock.

The Paymaster General's Office is essentially the government's banker, handling financial transactions for every department except the Inland Revenue and Customs.

Functions affected will include the provision of information relating to spending and borrowing requirements and this could seriously upset preparations for the Budget on April 3.

Latest details from the two unions on the general effects of their week-old selective strike action around the country is that businesses have been deprived of between £100 and £200 million.

What is described as "a fair amount of panic" has resulted from the strike by computer staff at the Government's Communications Headquarters in Cheltenham, according to Alastair Graham, deputy-

general secretary of the CPSA. "Many confidential tapes have been overwritten and ruined totally as a result of inexperienced people trying to get around our strike action at GCHQ," said Graham.

Pickets at Cheltenham, which houses the hot line to Washington, have turned away fuel supplies. Only two days' fuel remains and the unions claim that the situation will soon be critical.

A meeting with Lord Peart,

Lord Privy Seal, took place last Friday, March 2, at which Peart stated that pay increases based on PRU figures would be staged, with the final portion paid out on April 1, 1980.

"This is a move forward," said Campbell Christie, deputy general secretary of the CPSA, "and we expect other moves to be made. But key questions still have to be dealt with, and if these are not concluded to our satisfaction we have a Phase 2 package of strikes planned."

No back-up plans for Talisman

NO back-up plans have been made by the Stock Exchange to deal with a strike by operators of Talisman, the computer-based settlement system, even though it will probably be handling most of the UK's stock trading business by the end of the year. Director of the Talisman project, John Watson, told Computer Weekly, "There is very little we could do about a labour problem and it would not be feasible to transfer the Talisman system to a bureau if there was a strike. But we have very good labour relations here. A few of our operators belong to ASTMS, but the rest of our computer staff are non-union."

Watson pointed out that the Talisman system was well protected against physical failure or damage. The IBM 3031, on which the system will run, is duplexed with a 370/158 and to allow for the unlikely destruction of the installation the SE has acquired an empty computer suite where new kit could be up and running within two or three months.

To bridge the gap, Talisman would be run temporarily on a machine at some other big IBM installation, and Watson revealed that the SE was currently negotiating an agreement along those lines with "a big financial organisation."

Asked how quickly IBM could provide new hardware in the event of Talisman destruction, Watson said, "IBM have said that they would pull out all the stops, but they cannot make a firm commitment."

Most of the objections to Talisman made until now by SE members have been about the proposed charges for the system, and the SE Council has written to members agreeing to defer a final decision on the scale of charges until July.

The man who will run Talisman, Michael Baker, director of settlement services, pointed out that the SE will only need an extra 80 or so full-time clerks to run the system, while brokers should be able to divert themselves of between 1,000 and 2,000 clerical staff. Talisman will eliminate existing procedures like stock splitting and certification.

Talisman is scheduled to go live on April 9, only two weeks later than originally expected.

Plessey US sale
PLESSEY has sold its US core memory factory at Santa Ana, California, to Electronic Memories and Magnetics for \$600,000.

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German viewdata contract for ITT firm

THE contract to equip the German national Bildschirmtext viewdata centre has gone to the German subsidiary of ITT, Standard Elektrik Lorenz — but even the company itself does not yet know what it has been contracted to supply.

"The details of what we will be building have not yet been settled, but it should be made clear this week," an SEL spokesman in Stuttgart told Computer Weekly.

The most vital question is whether SEL is being asked to build a computer to run the Post Office's Prestel viewdata software, which the German PTT the Bundespost, has bought as the basis of its own national system. The phraseology of the contract implies that it is, but observers believe it highly unlikely.

"It seems certain that SEL will be asked simply to procure and install GEC 4080 computers to run the initial system," said Roger Woolfe, of consultancy Butler Cox and Partners.

"I think the Germans will live with the 4080 for a year or two, and then replace the whole system with a new one running on indigenous hardware."

"It would be a mistake to assume that Prestel will become the international standard," he said.

DG adds high speed channel on MN602

AN enhanced version of 16-bit Micronova microprocessor, the MN602, has been announced by Data General, with the MP/100 family MN602 based computers.

At the same time it has extended the performance of the MP/100 into the range of Nova class microcomputers, according to DG.

Improvements over the MN601 include a high speed Megabyte per second channel, an asynchronous memory that enables E2PROM to be used as well as RAM, PROM and support for 64K bytes of memory, the total to 128K bytes.

The MP/100 family costs £682 with 16K RAM in 25 plus qu, 8-bit chassis modules, costing £1,882 with 64K and a power supply, and a complete system with tape drive priced for the 64K byte version at £2,180 in qu. The 128K byte version costs £2,480.

The MP/200 is a bipolar version of the Micronova architecture and its performance features include an add time of microseconds, three times as fast as existing Micronova.

The board level MP/200 64K bytes costs £1,180 in qu. It has 25 plus qu, while the 128K byte version costs £1,480.

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Briefing 4300s ballot results soon

MORE than 500 orders for IBM's new 4331 and 4341 mainframes have gone into the UK ballot for first deliveries, and customers will be notified shortly of the place they have been allocated in the shipment queue. If this figure is reflected throughout IBM, it implies an order level of over 5,000 for the new machines will be held, as happened with the 4300.

IBM is unable to give a firm date for deliveries of machines ordered since March 1st when the "window" for the ballot closed, and it is possible a second ballot will be held, as happened with the 4300.

Micro threat

THE micro-computer will hit the mainframe, yet will probably pose no threat to the mainframe. This is one of the views likely to be expressed at the Inter-UK European Computing Review, a five-day conference to be held in London at the end of March.

Putting this view, Lionel Green, director of Grandmont Systems, said: "The micro-computer will not threaten the mainframe, but it will take the initiative in development of micro-based applications."

Share sale

BIRMINGHAM-based systems house Applied Computer Techniques is offering 10% of its shares for sale on the Stock Exchange. The shares in the privately-held company are not quoted but it hopes that they will be dealt in on the unlisted securities market. The move is seen as a first step towards going public.

Applied Computing Techniques forecast profits of £360,000 in the year to March 31, 1979.

Service with 2020s

THE in-house mainframe service soon to be introduced by GSI UK (CW, March 8), will be based on Digital Equipment 2020 machines like the competitor, the Onsite service offered by Automatic Data Processing. As an alternative to the DEC 2020, GSI UK will supply an as yet unnamed machine but it will not be IBM 4300s as offered by GSI on the Continent. See page 11.

Decision delayed

A DECISION on the siting of Motorola's European manufacturing base is now not expected until early next week. Both the Scottish Development Agency and the Irish Development Agency have offered financial assistance to the company, but the choice between them swells the return of chairman, L. J. Sevin, from a visit to China.

Human aspects

A SEMINAR on "The Human Aspects of Distributed Processing" is to be held on Thursday, March 22, at Birkbeck College, London, under the auspices of the BCS Specialist Group on the Human Aspects of Computer Usage. Starting time is 2 pm and entrance will cost £2.

International scene

Why is IBM being so generous to users? The performance cost ratio of the 4300s over the medium 370 models are quite dramatic, Fred Lamond analyses the motives behind the latest developments. See page 11.

Protocol problems

With the proliferation of computer networks the need for standard protocols to enable them to talk to each other has become vital. Derek Barker, director of EIR, puts forward a new approach designed to unlock the networks. See page 11.

Also...

Computational key to survival? Focus on planning and control. Euro standards co-ordinator. The Hot 50.

COMPUTER WEEKLY

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United chairman honoured

ONE of the highest honours that can be given in the UK for developments in electrical engineering, the Institution of Electrical Engineers' Faraday Medal, was awarded last week to Dr Robert Noyce, chairman of Intel, for his contribution to the development of integrated circuits.

Dr Noyce, who has been a pioneer in the development of integrated circuits, was awarded the medal for his work on the development of the first silicon integrated circuit, the 4004, in 1971.

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Strike likely to cause cash flow problems

CONTINUING and additional industrial action by members of the Society of Civil and Public Servants and the Civil and Public Servants Association seems likely. The action is an indication of a settlement, and a spokesman for SCPA told Computer Weekly that there was a "substantial lack of urgency on the government side. No further meeting with Lord Peart is planned, although the unions were to meet government officials tomorrow (Wednesday).

No VAT repayments are being made by Customs and Excise. The average pay-out to business is normally £122 million and British Steel Corp Export Division alone is believed to be expecting about £5 million. A lengthy dispute is likely to cause severe cash flow problems for both small and large companies as well as other groups such as farmers.

The Ministry of Defence computer installation in Liverpool is trying to help cash-strapped public contractors by making emergency payments of up to £200 million. This action is condemned by the SCPA because they say, "ad-hoc payments will be difficult to verify and check afterwards."

The dispute is hitting the office of the Paymaster General hard. However, agreement has been reached for a skeleton union staff to ensure the payment of Ferroc penalties.

Portable 'ring main' system developed at Cambridge

By Peter Howitt

A PORTABLE microcomputer operating system and processor-speed data ring hardware, developed by a Cambridge University team, could herald a new era of machine-independent distributed processing. Both are the products of a Cambridge-based software house.

The team, which is using both the microcomputer system, Tripos, and the data ring, was announced last week by Cambridge, at a one-day user group meeting devoted to BCPL (see Software File, page 7).

BCPL is the high-level system implementation language in which Tripos is predominantly written and from which it derives its portability.

The meeting was arranged by Toller Date, which is to market Tripos, under the name Trout, and is to begin marketing the ring system in the summer.

The meeting itself provided evidence of the keen interest being shown in BCPL by Siemens, which had four delegates attending from Germany. This could indicate that BCPL is under consideration for the proposed European Systems Language for which the EEC has

Such a system is widely seen as an ideal campus network.

Turn to page 2

THE first Lloyds underwriting group to reveal that it will lose money from insuring the residual values of leased IBM computers is the Sasse syndicate, which has estimated that it is likely to lose \$6 million on policies written in 1977.

Loss adjusters have already reported to a special Lloyds working party that underwriters could face claims totalling £10 million on the residual value policies. Other estimates put the figures nearer £200 million.

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Ten years ago...

COMPUTER WEEKLY MARCH 13, 1969

THE GPO started demonstrations to users of an off-line data capture system that was said to have great possibilities... ICL won £780,000-worth of business from the East Germany at the Leipzig fair and further orders worth £3.5 million were said to be in the pipeline... The proposed takeover of Scientific Data Systems by Xerox was approved by both boards, and shareholders would be asked for their blessing at annual meetings on May 15... The first multi-system system for ICL's System 4/40 and 4/80 was launched by the company. Called Multitest, it provided an interactive version of Fortran and could handle up to 16 terminals. Fortran was the mainstay of an online investigation and data retrieval system with real time and batch processing aspects. Crown Agents were purchasing a Honeywell H1250 with 98K store, four tape decks, four disc drives and four video terminals in each of the main offices.

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COMPUTERVIEW

The key to industrial survival

THERE is no time to lose if we are to make successful use of microelectronics and, as Jim Callaghan has said, the government intends to play its part in ensuring that Britain is in the forefront of developments.

This role includes initiatives in the fields of industrial training and education. Last week, the Department of Education and Science, in a consultative paper outlined a five-year, £12 million microelectronics development programme for schools and colleges (See page 3).

The programme sets out to provide a springboard for soundly-based wider developments throughout schools and further education colleges by exploiting existing skills.

This proposed investment is welcomed by ComputerView. It is announced none too soon: the US and Japan are clearly ahead in both education and the uses of microtechnology.

Some schools have already taken the initiative and purchased or been given small computer systems. For instance, at Marlborough College, the public school in Wiltshire, even first-year pupils are given an introductory course, with programming in Basic taught in the second year (CW, February 23, 1978).

Given the opportunity, the enthusiasm shown by schoolchildren in learning how to use the computer shows no bounds.

When small is beautiful and dangerous

THINKING small is hardly one of the DPM's more noted approaches to work. Over the computing generations, he has been conditioned to meeting the ever-increasing demands with bigger, better and often more complex resources.

However, all could now be about to change. According to Ted Cluff (CW, February 22), the Institute of Data Processing Management is not only conducting an industry survey on the impact of micro technology, but is also setting up a micro user group for businesses and the professions.

The DPM, it seems, will have to adapt to new techniques. No longer will an order be signed for that 64K mainframe with fingers crossed that an extra 64K memory will not have to be added on three months after implementation. He will settle for a 16-bit micro-based system and any upgrade would involve adding-on another micro with on-chip storage.

Full-scale feasibility procedures could well become redundant. Choosing between the rival merits of IBM and Honeywell could involve comprehensive power/performance/cost formulae. There is, however, less at stake, particularly in cost, when the choice is between an Apple or Pet.

For the DPM, selection in any case usually extends beyond that of pure cost. Factors such as back-up, engineering response time and delivery dates often weigh the scales of selection. Back-up for the micro, however, could well be the opening hours of the local byte shop, engineering response time, the period it takes to phone for advice or open the user do-it-yourself manual; and delivery schedules, the time it takes to unwrap a micro.

It is not just the work-style of the DPM manager which is facing the winds of change. Gusts are blowing towards the analyst and programmer. Not so long ago the DPM team had an assured future. Provided technologies could keep pace with their expanding requirements all would be well. No sooner had one technology been explored, than another arrived. Before the DPM could mutter, Mass Array or Amdahl, a new technology, bubble burst on the scene.

Computer databases were expanding almost as fast as the DPM's seat of power. But with the current emphasis on the

Portable 'ring main' system

From front pages providing each student researcher with a low cost personal computer that can access more powerful hardware software in the network required.

An attractive alternative to large time shared mainframes, constitutes in effect a localisation of such services as Apple.

The Cambridge ring system may also have a strong appeal for certain commercial applications, notably where computer portability is required and distributed database systems.

The operating system component, Tripos, is at present single user, multi-task operating system that includes facilities for compiling, linking, and debugging BCL programs, an editor, and a file handler.

Fortran and Basic are expected to be added by the summer, with Pascal and Lisp under consideration for later implementation. There are plans to adapt the system to multiple users.

The network hardware consists of standard two-wire cable and a number of data communication ports, each of which is required for each processor, on the ring (CW, September 14, 1978). Data is transferred by the ports at a rate of 100,000 bits per second, and the ring is a single packet, only interrupting machine to which it is addressed.

Currently implemented, printed circuit boards, about £1,500, the ring is likely to be available as a twin chip device in about 1980.

In the operational Cambridge ring, Tripos is already running on three processor types: DEC's PDP-11, and the D General Nova.

person, the greater the threat of unemployment.

We have witnessed tremendous changes in technology in the last 25 years and the technical demands placed on the software and hardware designers mean constant revision of ideas and adoption of new techniques at an increasing rate. Constancy is not a characteristic of the computer industry.

With this horizontal growth in technological application and vertical growth in complexity there has been a corresponding proliferation in seminars, courses and conferences. There is a course for the computer professional on any subject, however obscure.

But other changes are needed in the educational system and these are the attitudes necessary to cope with the effects of computers on employment levels.

In May last year, Tony Benn, the Energy Minister, called for a complete rethinking of our educational system. He urged increased education to cope with increased leisure time and the likelihood of shorter weeks and shorter working lives.

At the back of every working person's mind must be the fear of replacement by machine. This fear is often voiced by trade union leaders. The unemployed have no voice. The unskilled, unqualified 16-year-old of 1984 might never find work, but at the same time we have to harness the most sophisticated technology in manufacturing (and elsewhere) to survive as an industrial nation. This is our Catch-22.

Post Computerviews have urged governments to rethink the educational system to alleviate the effects of mass unemployment.

The current education programme hopes to place the key in the door. We must make sure it fits.

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Call for central agency to run £12m micros in schools programme

A CENTRAL agency should be set up to administer the government's programme for promoting microelectronics in schools, funding curriculum development projects and teacher training courses. That is the principal recommendation in a consultative paper issued by the Department of Education and Science. Interested parties are invited to reply by April 12.

The government estimates that £2.5 million a year will be spent on this programme over the next five years. The agency would have a steering committee with members from local authorities, teachers' bodies, and such organisations as the Schools Council, the Council for Education Technology, and the National Computing Centre.

The DES recognises that the agency's work could overlap with that of existing bodies and says that it must be able to co-operate with these. For instance, the programme might fund the introduction of new equipment for particular projects in schools, but the continuing supply of such equipment would remain the responsibility of local education authorities.

Computer-Aided Learning will be a particularly important part of the programme, not having established itself widely in schools so far, according to the DES. There will need to be an early assessment of the scope for expansion of CAL in schools and colleges.

Further education will also be involved in the programme, as will the implications of micros for vocational training, such as their effect on secretarial skills. Social effects, such as on employment, will however not be covered, nor will the technology of microelectronics itself. Applications is the central theme.

Patrick Raymond of the National Computing Centre, said that the organisational proposals "made sense", adding that he was pleased that the NCC would be included on the steering committee. The success of the programme, he said, would depend largely on the steering committee starting up worthwhile projects.

Assessing suitable equipment for use by schools and colleges will be another of the programme's tasks.

These plans are for England, Wales and Northern Ireland only. Separate work is being done on plans for Scotland.

Timetable for Times technology agreed

THE thorny question of direct input by journalists at The Times, left unresolved by last week's agreement on talks between management and unions, seems likely to lead to a phased introduction over a number of years.

The National Graphical Association, the main print union, while sticking to the view that it should control all key-boardings, has agreed to the principle of timetables for the introduction of new technology and staffing levels, with "arrangements for future joint reviews."

After three months' suspension of The Times titles, a formula was reached whereby the unions agreed to talk in return for reinstatement and back pay for suspended staff. April 17 has been set for reopening publication. Any issues left unresolved by April 7 are to be referred to ACAS for conciliation; but this, unlike arbitration, would not be binding on either side.

At the same time, the Price Commission published a report on the request by the Daily Telegraph to raise its cover price. In this the Commission suggested that the Telegraph should proceed speedily with the introduction of new technology.

In British industry, a meeting between DoI officials and the CDRA is expected within a fortnight, at which the report's proposals will be discussed. These include plans to promote greater industrial awareness of microelectronics, the provision of more engineering training courses and places, the provision of long-term projects such as workshop training facilities, and the provision of wider and more comprehensive information services.

Some money for the programme is expected to be available from industry, with the DoI providing the balance.

Expanding micros in industry

A REPORT from the Committee of Directors of Research Associations has been sent to Secretary of State for Industry, Eric Varley, outlining a £2 million programme for expanding the exploitation of microelectronics and the microprocessor.

In British industry, a meeting between DoI officials and the CDRA is expected within a fortnight, at which the report's proposals will be discussed. These include plans to promote greater industrial awareness of microelectronics, the provision of more engineering training courses and places, the provision of long-term projects such as workshop training facilities, and the provision of wider and more comprehensive information services.

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Doug Eyeions vice-president of CSA

DOUG EYIONS, technical director of BOC Computing Services, has become the vice-president of the Computing Services Association, following the election of Jim Donaldson as president (CW, February 16).

Also taking up new appointments are Basil Cousins, of Computrol, who will be chairman of the membership committee, and Ann Russell, of F International, who has become chairman of the external services committee.



'Open government' proposals

THE government is expected to put forward proposals of its own for "open government," in competition with Clement Freud's Freedom of Information Bill, at the same time as the publication later this month of a survey of the operation of such laws in other countries. This makes it less likely that Freud's Bill will be given the extra time it needs in order to get through its Report Stage on the floor of the Commons (CW, March 1).

The proposals, which will probably take the form of a Green Paper, are expected to be in line with current policy of both front benches — that civil servants should be required to "consider" requests to see documents from members of the public but would not be compelled to disclose anything.

This is unacceptable to Freud and his supporters, who want a statutory right of access.

A survey of overseas experience, will go into the cost of Freedom of Information.

Post Office introduces fax service

FOR a limited facsimile service, to be introduced in the London and the North Eastern telecom communications regions, the Post Office has ordered 100 Siemens HF 1048 transceivers.

The Group 2 devices transmit or receive a full A4 page in three minutes and this is cut to two minutes where one HF 1048 is communicating with another. The facsimile machines will be delivered from Siemens at Cramlington, Cheshire.

The corporation calls the service Fomafax, and will offer two other machines as well as the Siemens device. One will be the ITT Credo 3500, and the other will come from an as yet unidentified supplier.

£1.1m order

COMPLETING the reorganisation of its computing facilities around Honeywell hardware, Strathclyde Regional Council has ordered a second level 68 microframe and three level 16 minicomputers, altogether worth £1.1 million.

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GILB'S MYTHODOLOGY

Need for training in program maintenance

LAST November, a New York client described a pressing problem to me. The maintenance people they had for their most critical online system (one with 1,800 terminal operators) kept quitting on them faster than they could be replaced.

The client was hiring recent computer science graduates, training them in assembler and the "system," only to find that they then decided that the pressure of 400 or more backlogged change requests, and a critical online system upon which hundreds of employees were dependent and with which the general public came into regular contact, was too much of a pressure.

They quit in six months. This led me to wonder aloud to them if they had similar problems with their maintenance people for the company's electrical systems in the field. Or for that matter did their supplier, IBM, experience similar problems of instability with their field maintenance people?

Maybe if we recruited atomic physics graduates to paint atomic reactor power stations, they would quit their job too? Maybe if IBM took experienced computer-writing technicians and asked them to do field maintenance there would also be some difficulties.

In the case of my New York client, I had the strong feeling that the candidate they recruited were not particularly trained or motivated for the job they were given. They only took the job because it gave them a start in industry, and they did not understand the nature of the work.

A month later I was visiting an old professional colleague at a Norwegian technical training college with a recently started

two-year training course in computers. My colleague had a simultaneous commitment to graduate computer science students at Oslo University, so it was natural that we asked the question of what difference there was between the technical colleges and university students.

There was one: in length-of-study, practical-versus-academic, and even quality of recruitment. But, the basic syllabus and orientation was not substantially different from what we have seen all over the world.

I raised the question of whether this technical college could consider training a specialist in program maintenance, either as a directly recruited two year study, or as a third year specialisation.

In almost any well established company using a computer, from 30% to nearly 100% of the programming staff are engaged in maintenance of some sort or other. There would seem to be a real need for people especially trained and motivated in this area. Yet I have never heard of a training programme especially for program maintenance.

It is possible that maintenance requires a particular type of person, who might be very different from those who lead projects, design systems, or code someone's pseudocode into Cobol.

It is possible that the vast array of tools and techniques which has surfaced to analyse program actions, and changes and help with testing, requires in-depth study and orientation by specialists.

In today's immediate climate in several parts of the world, the demand for programmers is artificially high. This state cannot last, and we might well again see



over-production of computer specialists. This might be the time for both centres of training and employers to ask if some of the over-production should be guaranteed useful employment by being recruited and trained especially to solve the demanding problems of program maintenance.

The specialisation is necessary now, in the long run it is inevitable. I suspect our profession will be unusually slow in responding to the need.

Perhaps some readers are already engaged in some less formal recruitment and training for maintenance departments, and can report stable and successful professionals. Perhaps some training institutions are already training for this specialty. It would be interesting to hear if this is so.

Q-Pac offers payroll service

HAVING taken over from Package Programs Ltd as the UK agent for Q-Pac (Software File, January 18), Q-Pac Services has forged a link with Southwark

Sharp adds databases to time sharing service

FOUR new databases have been added by I.P. Sharp to those already available under the APL time sharing service.

Three are in the field of aviation and consist of the Official Airline Guide (US International Air Travel Statistics) and the T8 Air Charter Databases. Sharp is the first time sharing company to offer the OAG database, which contains data on 200,000 North American and international flights each month.

Also newly available is Petroseries, comprising historical time sharing data on production, stocks, and imports of crude petroleum products in the US.

With these additions, Sharp has brought up to 30 the number of databases it offers. They are concentrated mainly in aviation, banking, demography, economics, energy, and investment.

140% growth at Slinn in 1978

PROFITS of £75,000 on a turnover of £45,000 have been reported by the Sheffield-based software house, Slinn Computer Group. Representing a growth of 140% over the 1977 figures, this will be topped this year by a turnover exceeding £1 million, according to managing director Mike Slinn.

Fastest growing sector is the Hong Kong subsidiary, which is the exclusive contractor for software for Burroughs systems in the Crown colony. Initially

tasked mainly with bespoke developments, the firm has found an increasing market for software packages in the last six months — particularly for the B80 minicomputer.

In addition to the Sheffield company, Slinn operations in the UK include Slinn Systems Associates, in Bradford, which specialises in VRC software, and Law Data Systems, in Leeds, which specialises in legal applications.

Puzzler

I HAVE before me a simple, yet fascinating three-dimensional puzzle, consisting of four cubes painted red, yellow, green and blue, with just one colour to each side. The problem is to lay them out in a line "shoulder to shoulder" so that each row of four faces (top, front, base, and rear) contains all four colours, in any order.

The colours are placed cunningly so that only one basic layout will do. Let me describe each cube in turn.

The first one, as I look at it now, has red on top, yellow at the front, red underneath, blue at the rear, red on the right-hand side, and green on the left-hand side.

The second cube in my randomly placed row reads blue on top, green front, yellow base, green rear, red right-hand, blue left-hand. Colour dispositions on the third cube are green top, blue front, yellow base, red rear, yellow right-hand, red left-hand.

The fourth cube shows green top, yellow front, red base, blue rear. As you can see, the possibilities are very numerous, but suitable "props" such as wooden building blocks will be a great help. See page 68 for solution.

SOFTWARE FILE-1

Aid to real time diagnosis and recovery on PDP-11

A PACKAGE that could be a very significant aid to those implementing real time systems on the DEC PDP-11 has been developed by the Software Products Division of John Bell Computer Services.

Called Radar (Real-time Aid to Diagnosis And Recovery), the new product provides in a package many of the logging, monitoring and recovery functions usually developed as part of the application. It thus ensures that such tasks are handled consistently throughout the application, while also offering a chance to reduce development time-scales.

Radar works by intercepting program calls to the operating system. Such calls are replaced in the user's program with a Radar macro, which passes the requisite data to the Radar task itself.

This is an 8,500 byte routine, written in Macro-11, that runs as a high priority task under DEC's RSX-11M, RSX-11D, or IAS operating system.

Radar supports user programs written in Coral, Fortran, or Macro-11 and one of its most useful functions is the documentation of program interaction in a multi-tasking environment.

Details of inter-task communication are written by the system to its logging file, and a report can subsequently be produced showing which tasks communicated to which, and when. This can be used not only to investigate processing bottlenecks, but also to unravel system "locks."

Another important system function is file security logging. Facilities are available for logging record images (and data areas) both before and after updating, and the images can be used to restore the file in the case of a system crash or corruption.

Where the difficulty of re-

creating a situation exists on the validity of error messages, the Radar log before failure and during the recovery process to ensure that correction has been tested under the same conditions.

A further problem addressed by Radar is error checking. Frequently treated casually, user programs, error returned by the operating system are screened consistently.

Radar will be marketed by John Bell's software products division and in the UK Germany by subsidiaries of John Bell Group. It will be at around £1,500.

Comprehensive BOM written in Dicol

A COMPREHENSIVE bill of material processor operating on DEC PDP-11 systems is being marketed by Hords Computing, of Stafford. Written in Dicol, the software requires a minimum configuration of a 64K 11/34.

Up to 100 levels of assembly breakdown can be handled

by the system, which implements the basic BOM key level and multi-level options and implosion functions. It is used to support production control, purchase order control, and inventory control.

Among reports that can be produced are whereof manufacturing status report, production schedule.

A significant feature of the system is that it is interactive. A system manager operator processing programs are self-promoting.

Hours, which notes the shop and mass production environments, obtained from the US and a permanent licence at a price of £5,250.

Zeus-Hermes reorganisation

THE three other computer-making up the new reorganised Zeus-Hermes (Software File, March 12) Zeus-Hermes Ireland, Zeus-Hermes Recruitment, and Plum Designs — a graphics printing company based in Albion, Herts.

Special travel arrangements to visit the Compec Europe Exhibition (Brussels)

IPC Electrical-Electronic Press Ltd., the world's largest publishers of computer, electrical and electronic journals, have made special arrangements for readers wishing to visit the Compec Europe Exhibition. The cost includes travel by scheduled airline from

Heathrow to Brussels, a reserved room at the Hotel, Rogier, and a departure transfer to the Exhibition. The cost is £1,500 per person.

For a full brochure, contact IPC Electrical-Electronic Press Ltd., 1678 (Brighton) at the Exhibition from £205.00.

SOFTWARE FILE-2

Commercial users take keen notice of 'academic' language

EVIDENCE that BCPL is emerging rapidly from the underground and fast finding favour with a wide variety of users was available in plenty at the inaugural meeting of the BCPL users' group, held in Cambridge last week.

Surprising even those who arranged it, the meeting attracted nearly 80 delegates, including users from several European countries and many commercial organisations.

Notable companies attending included Ford, Siemens, Saab Scania, Marconi, EMI, Rediffon, and Logica. All of these, it emerged, had either completed projects in BCPL or were currently in the middle of development.

Also in evidence were a number of major scientific and research establishments, including the Rutherford Laboratory and CERN, of Geneva.

With usage growing fast and implementations proliferating, one of the major objectives of the group is to define a language standard.

Although now 12 years old, and relatively stable for the last seven, BCPL would benefit, it is felt, from a written definition. This would naturally include the language core but is particularly important in the case of the run-time system and the controversial area of language extensions.

That such proposals may now

be taken seriously indicates the progress made by BCPL since three years ago, when the circulation of a draft standard was met with a resounding silence.

The observance of a strict standard by compiler writers would, of course, help to enhance the high degree of portability already enjoyed by BCPL applications.

Portability is one of BCPL's principal advantages over its usual competitor — assembler — and was a recurrent theme during one of the group's most informative sessions, in which users discussed their applications.

A typical example was that of CERN, where users have access to a very wide range of machines and expect to find identical software tools on each. BCPL had been used there to build machine-independent user interfaces and utilities such as editors and text processors. A major application had been the construction of a comprehensive network linking the machines.

Among those using BCPL for application programming were Ford and Siemens. Ford, for instance, had written a quality, repair, and surveillance system for a PDP-11/04, while Siemens had used BCPL to program its Teleperm-M process control automation system.

Initially built round the Intel 8080, the system had subsequently been implemented using

intermediate language, P-code.

BCPL also employs an intermediate language, called O-code, and it is the ease with which O-code to machine code translators can be built that makes BCPL "portable." Given a compiler front-end — also written in BCPL — a code generator for a new machine can be written in a period usually quoted as between four and eight man weeks.

BCPL has up till now existed as an "underground" movement, centred round Cambridge. The computing laboratory there regards BCPL — and products written in it such as Tripos — as research results; as such, it makes them freely available to other academic institutions for a nominal distribution charge.

Commercial users supplied by the lab are asked to make a donation — generally around £250 for a BCPL compiler or the Tripos operating system.

The University of Essex also distributes BCPL software, having supplied some 70 users with its own implementation of the language. In addition, compilers and other software are exchanged between users, though this has so far gone on without the help of an active user group such as that enjoyed by Pascal users.

With growing non-academic use, a number of software houses are gearing up to develop and sell BCPL software. A key feature is the development of portable compilers written in BCPL. Of particular note is the family of "orthogonal" compilers being developed by HPAC, of Oxford (Software File, November 30, 1978).

Toltec Data, of Cambridge, is also active in the BCPL field. It will be supplying Fortran and Basic compilers with its supported version of Tripos, called Trout, and is planning to develop other compilers for other languages, including Algol.

By Peter Hewitt

For easy transition to Series 1

SOFTWARE enabling IBM System 32 users to migrate smoothly to the Series 1 minicomputer is being developed by a US software house, Series One Inc, of Greenville, South Carolina. First product from the firm is an RPG II compiler largely compatible with that provided on the System 32.

The compiler runs on the Series 1 under the RPS operating system, and conforms closely to IBM documentation for System 32 RPG II. There are, however, a number of language features omitted in the first release, including Inquiry Interrupt, the copy function, and support for external assembler subroutines.

MVS performance monitor

THE argument that CAP-CPP's new MVS performance monitor, CMF, is competitively priced was weakened by a significant omission from last week's story

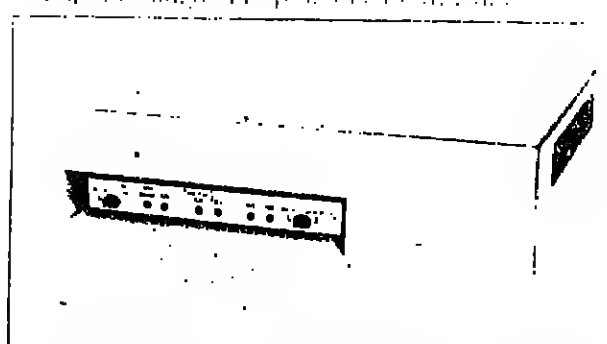
(Software File, March 8). Unlike IBM's RMF II, a single CMF licence is valid for multiple CPUs; most UK MVS users run it on at least two processors.

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A discount you can't ignore for all educational users on Lear Siegler vdu's and printers

GTS, part of the Gamma Group, is now able to offer Lear Siegler ADM-3A vdu's and printers at 7 1/2% discount to educational users for a limited period. The ADM-3A vdu and printers are currently available ex-stock.



GTS is one of the UK's leading suppliers of Lear Siegler vdu's and printers and as such can provide you with the complete service that you require from your vdu/terminal supplier. Call or write to Richard Kendall, Gamma Telecommunications Systems Ltd, 22 Market Place, Wokingham, Berks RG11 1AR. Tel: 0734 791364 Telex: 847630 or Jim Watt, GTS (Scotland) Ltd, 191 High Street, Kirkcaldy, Sct. Fife KY11 1JF. Tel: 0452 31160.



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PEOPLE AND EVENTS

Computer Automation changes

COMPUTER AUTOMATION has appointed Michael Sack as managing director. He succeeds Geoffrey Salkeld, who has become deputy chairman in addition to his position as vice-president of European operations. Glazebrook-Sack was a founder director of Telex International, after working for nine years with IBM. Reporting directly to Salkeld as European financial controller is Christopher Birks. He joins Computer Automation from Memorex Europe, where he was treasurer for Europe, the Middle East and Africa.

Bernard Lavelle, formerly production controller with Tally Information, has been appointed sales office administration manager for the company.

John Hayes has been appointed territory manager, East Midlands, for Computer Machinery Company. He has worked for CMC's technical support division for the past three years, but in his new capacity he will be responsible for all sales in the East Midlands area.

Michael Shacklady has become a development engineer with Dicol Electronics. Before joining the company, he was control technologist with Mars, concerned with the design and development of electrical and electronic control systems. Shacklady, who has also worked for Roneo Vickers and RHM Foods, is an associated member of the British Institute of Management.

Gerald Fleming and Donald Pate have been made vice-presidents in international operations for Northern Telecom Systems Corp. Fleming recently returned from London where he was general manager of Data 100 Corp's European marketing activity, and is now vice-president, marketing development. Vice-president, international distributor sales, is Donald Pate, who was formerly director of international sales for Sycon. He joined Sycon in 1971 as a district sales manager and was later promoted to director of Far East marketing.

Derrick Maddern has been appointed sales manager for Teletext Equipment of Tring. He has worked for the sales and marketing division of Cable and Wireless for the past 22 years.

DIARY

MARCH 18-21
IBM - The seal five years, Infotech State of the Art conference, Hotel Sofitel, Paris. Contact Dave Bates: 0623 35931.
MARCH 20
Logic for databases and programs. R. Kowalski. BCS Formal Aspects of Computing Science Group, Polytechnic of Central London, London W1. 18.30.
Recent developments in point of sales terminals. IEE/IEE Computer Group, Royal Institution, Albemarle Street, London W1. 10.00.
Visit to IBM ISI Coshom. BCS Hampshire branch. IBM Information Services, Coshom, 18.00.
Ms. coprocessors - from the user's point of view. Or E. O. Ashworth. IEE/E, Leicester Polytechnic, Leicester, 18.30.
CAFS. BCS Preston branch. Blackburn Technical College, Blackburn, 18.30.
MARCH 21
Practical privacy. Ted Cluff. IDPM Central London branch. Pearl and Dean Studio, Broadwick House, Broadwick Street, London W1. 18.00.
Systematic Kit Orindley. BCS Cobol group. BCS, 13 Mansfield Street, London W1. 14.15.
The world of microprocessors. European Study Conference, Hydo Park Hotel, London SW1. 9.00.
Visit to Royal Sussex County Hospital. BCS Sussex branch. Postgraduate Medical Centre, Eastern Road, Brighton, 18.30.



Cronin
Mortin
Flynn
Florendinus
Finet
Allen
Guthrie
O'Reilly

Eugene Cronin has been appointed vice-president, Europe, for Documentation Incorporated. He previously held the position of vice-president of administration for the company, and in his new role will be responsible for the company's European operations.

Maurl Mortin has been appointed by National Semiconductor as business unit manager for Northern Europe. He will be responsible for the company's sales and marketing operations in the UK and Scandinavia. Prior to his present appointment he held the post of regional manager for Northern California and Nevada.

Jacques Finet has become manager of the Paris centre of University Computing Company. Finet, who is a graduate in electronic engineering, has worked for several years as a systems engineer with ICL in France. He has also worked in the marketing sphere for SIA and then Franlob. In his new position he will be responsible for the business operations of UCC (France).

Len de Jager has been appointed senior technical support engineer for Compeda's team in Holland. He was previously a project engineer with Shell Internationale Chemie Mij in The Hague. Joel Florantius, formerly with Crawford and Russell, has become a senior technical sales consultant. He has also worked for Marconi and with the Control Systems Centre at UMIST, Manchester.

Les O'Reilly has become director and general manager of Eastern Computer Services, Peterborough. Previously he was production director with the company, and before that was general manager of the retail division of Geant, the company's parent organisation.

Brian Dix has become managing director of Nolton Communications. He was previously managing director of Ultra Electronics and its associated company, Brindon Printed Circuits.

Dave Lawrence has joined Allison Computer Media as Southern area manager. He was previously data centre manager with DP Advisers, the South London bureau.

Mechanical handling and sorting of mail. P. J. O'Doherty. IETE, Watlington Community Centre, Watlington, Henley, 18.30.
The micro revolution and Horizon. 'The Chips are down'. BCS Manchester branch. NCC Oxford Road, Manchester, 18.30.
MARCH 21-22
IBM CUA Local authorities group. County Hall, Exeter, 14.00.

MARCH 22
Designing the system for people. J. Dadda. BCS West Herts branch. Heath Park Hotel, Hemel Hempstead, 18.30.
The role of large computers in the 1980s. Prof. F. Sumner. BCS Wolverhampton branch. Lecture Theatre C7, the Polytechnic, Wolverhampton, 19.00.
MARCH 23-24
Vacation school. IEE University of Oxford, Oxford. Register IEE Secretary, ref. LS(OA).

MARCH 23-24
European Computing Review. Infotech. The Connaught Rooms, London. Contact Dave Bates: 0623 35931.
Achieving project plans, seminar. Association of Project Managers, Jersey. Details AFPM, 01-799 3182.
MARCH 24-27
Business game BCS Nottingham branch. Book teams through Margaret Morley, Cripps Computing Centre, Nottingham University, Nottingham, 18.30.

By Judith Morris

Fellowship

IN recognition of his work in satellite and space technology, Dr John Plares has been awarded the fifth Marconi International Fellowship. Plares, a professor of engineering at the California Institute of Technology, has been granted more than \$50,000 for investigations in electronic and communication circuits, retired from Bell Laboratories, 1971.

The Fellowship was established in 1974 on the 100th anniversary of Marconi's birth and is administered by Aspen Institute for Humanistic Studies, Colorado.

VAX: "An implementor's dream."

Dr. Brian Ford, Director, Numerical Algorithms Group Oxford, England/Downers Grove, Illinois



Power board to update

A DUAL IC 2872 and a 2880 are to replace the System 4/72 and System 4/70 at the South of Scotland Electricity Board. The board will be making use of the ability to use storage and peripherals with the 2880 before being transferred to the main installation.

Initially, the 2880 will be used for program development and conversion. Some programs, however, will not be converted at all, but will ultimately run on the 2880 under DME System 4. Among new applications to be developed are a plant scheduling system and a terminal network system.

Mainframe change for bureau's UK users

GSI, the giant French-owned bureau group which intends to provide its bigger time-sharing clients all over Europe with in-house mainframe processing (CW, March 8) will offer on or yet unannounced machine to its UK customers rather than the IBM 4300 computers being offered to Continental clients. But the Digital Equipment 2020 would definitely be offered here.

GSI UK, formerly CRC, said that GSI in France had already started offering 4300s to customers there but pointed out that there were no plans to offer 4300s in the UK.

The other interest in the DEC 2020 in the UK was as a possible replacement for the three obsolete RXDS Sigma 8s at Slough which form the centre of the time sharing service marketed throughout Europe by GSI.

The in-house service to be offered by GSI will be similar in concept to the Onsite service offered in the US and Europe by Automatic Data Processing. Onsite is a comprehensive package comprising ADP software and support and DEC 2020 hardware, all provided by ADP as a complement to its time sharing service.

Powerful rival to 3033 from Intel

INTEL can now offer IBM users a more powerful alternative to the 3033 at lower cost in the form of the AS/6 Attached Processor. The AS/6 AP is rated at more than 4.8 mips, compared with 4.7 mips for the 3033 and 2.9 for the existing AS/8. The latter is Intel's more powerful alternative to the 3032.

The cost per mip of the AS/6 AP works out at about \$370,000, says the company, giving it a

price/performance of 83% if the 3033 is taken as 100%. According to Intel the comparable AMDahl machine, the V/8 II, is 65%.

The AS/6 AP provides AS/6 users with an easy growth path and like the AS/8 is built in Japan by Hitachi.

Intel already offers direct alternatives to the IBM 3031 and the 3031 AP in the form of the AS/5-7031 and the AS/5-7031 AP. Intel says that price/performance figures of these machines are between 70% and 80% of the 3031s. Their mips ratings range between 1.2 and 1.8.

While its AS/5 and AS/6 machines still beat their IBM counterparts in price/performance, the AS/3-5, announced two weeks ago as a counter to the 4341 (CW, March 1), costs more than twice as much to purchase as the 4341, mainly because the latter comes with very expensive memory based on 64K bit chips.

But Intel has adopted a ploy of offering the AS/3-5 on a short lease of 18 or 24 months at charges that are 20% less than the rental on a 148. So the AS/

3-5 could be a less expensive alternative for a small 370 user who needs extra power now and cannot wait for a 4341 to be delivered.

Unlike the 148 the AS/3-5 more than matches the 4341 in power and Intel hopes that at the end of the short lease period many AS/3-5 users will agree to renew their lease contracts at new rates which will be much lower and which will compare favourably with the 4341. In this way the AS/3-5 user could be persuaded to keep his AS/3-5 instead of renting a 4341.

Alternatively, the AS/3-5 user can purchase his machine from Intel at the end of the short lease period with a significant discount.

Intel can deliver an AS/3-5 within six weeks and provides MVS support with the machine, a provision which is not available from IBM with its 4341.

The AS/3-5 has a power rating of one mip and has superseded the two original AS/3 machines and the AS/4. The latter was Intel's original answer to the 148, but like the 148 is dramatically outperformed by the 4341.

MP/200 uses 'half-card'

THE high speed bipolar version of the Microvna microcomputer, the MP/200, introduced last week by Data General (CW, March 8), is built around the same AMD 2801 series bit slice chip set as the Nova 4 family announced late last year (CW, December 21/28, 1978).

The essential difference between the MP/200 and the smallest Nova 4 machine, the IC, is

that the AMD 2801 processor in the IC is contained on a 15in x 15in board along with 32K words of memory, while with the MP/200 it comes on a 7 1/2in x 7 1/2in board. The latter can be slotted into the 8-slot chassis used by the smaller MP/100 Microvna system, so that an MP/200 can be upgraded to an MP/200 simply by replacing the appropriate PC board.

Eurodata results to be held on Infonet

RESULTS of the 1979 Eurodata study will be held on Infonet, the Computer Sciences Corp remote computing service, and be accessible via dial-up lines to the 17 European PTTs and the Eurodata Foundation which

commissioned the study last year (CW, March 9, 1978).

Logica, which undertook the £1 million study, is now processing the information gathered from the PTTs and from interviews with over 4,000 users.



For the Numerical Algorithms Group, the plain fact is this: "Software implementation was faster on the VAX-11/780 than on 25 other major machines."

Before VAX, Dr. Ford's staff had implemented NAG's complex FORTRAN Mark 6 Library on 25 major machines ranging from minis to mainframes, including the Burroughs 6700, CDC7600, Univac 1100, and IBM 370. The average implementation time was 13 man-weeks.

VAX took five. In Dr. Ford's words: "The NAG FORTRAN Mark 6 Library consists of 345 subroutines covering the major areas of numerical mathematics and statistics. It's used in applications such as structural design, nuclear physics, economic modelling, and academic research."

features are file creation, file comparison, file manipulation and file maintenance.

And then there was the record of VAX reliability. "No problems were encountered in the VAX/VMS software even though approximately 3000 files were being handled. The operational availability time for the machine was close to 100%, an outstanding statistic for new hardware and a new operating system."

What all this demonstrates is that some of the most sophisticated FORTRAN routines in the world implement easily on VAX. That VAX capability exceeds that of many machines far more expensive. That the VAX-11/780 is more than the most powerful 32-bit computer in its price range. That VAX is truly "an implementor's dream". For more information, simply clip the coupon.

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"A successful implementation requires the correct functioning of the 345 library routines to a prescribed accuracy and efficiency in execution of NAG's suite of 820 test programs. Whilst the activity is a significant examination of a machine's conformity to the ANSI standard of the FORTRAN compiler, its main technical

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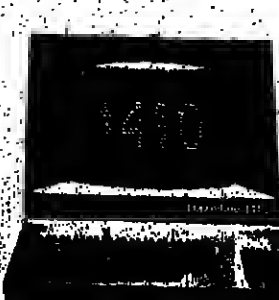
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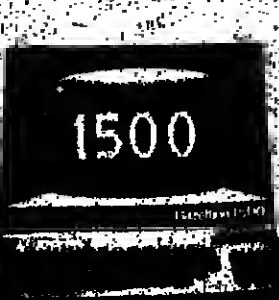
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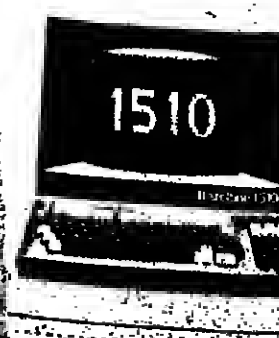
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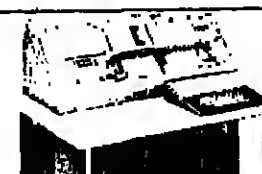
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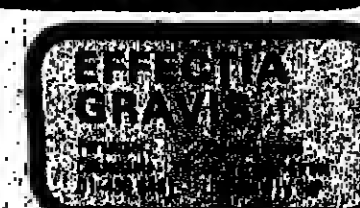
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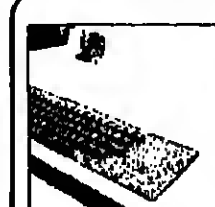
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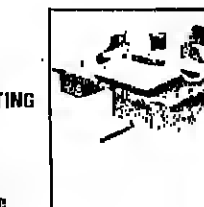
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COMPUTER WEEKLY

COMPUTER WEEKLY *International*

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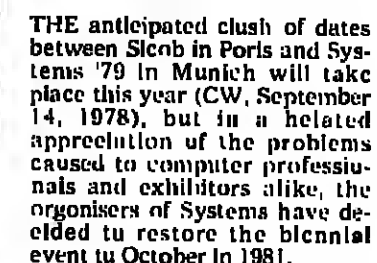
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Both systems are designed for use by non-specialists, and among the user aids are menu selection of commands, and symbolic commands based on a graphic tablet.

The new big name in computers

End of govt contract review board

THE Renegotiation Board, a US government agency that reviews contracts between private business and certain government buyers, is expected to close its doors at the end of the month after 23 years of service. One force said to be behind the demolition of the small but powerful agency is the pressure from groups representing government contractors. A last-minute Congressional effort could give the board a temporary stay of execution.

Recently the board ordered IBM to pay \$42 million in excess profits back to the government. IBM has disputed this assessment, and is to go to court to fight the ruling. The action is based on an examination of IBM's computer leases in 1969 and 1970.

Other firms were assessed \$31 million this year, which included penalties for contracts involving companies.

These actions, and others in the past, have angered opponents of the board, and it is believed that these companies, through lobbying organisations, played a role in its demise.

Government sources indicate that some of the strongest lobbying against the Renegotiation Board came from the Electronics Industry Association, the Machine and Allied Products Institute and representatives of aerospace companies.

AMERICAN SCENE

BY HESH WIENER AND CAMERON DAVIS

Earnings rise, but the market falls

CONFUSION over oil supplies, relations with China, inflation, recession and American politics has left stock analysts in an untenable position.

A computer stock expert says, "One school of thought has the market really dropping. Another has it rising rapidly in anticipation of improved corporate earnings. In other words, nobody seems to know what's going on."

The circumstances are indeed puzzling. Computer companies and the majority of America's large corporations are experiencing an extremely profitable period. Corporate earnings, which jumped upward during the last quarter of 1978, are expected to remain high through the first quarter of 1979 and, for many companies, through mid-year.

Computer stocks have been sold lately, even IBM, which bobbed below 300 during mid-February, despite an impending stock split, the announcement of several attractive products and the expectation that the company would not be greatly affected by any recession that might occur.

Other computer companies have also lost value, in part because of the general Wall Street attitude and in part because of the challenge posed by IBM's 4300 and 8100 computers.

There is no question that the market positions of computer companies will depend on their responses to IBM's price/performance improvements. While IBM's competitors are resourceful, and have always responded to the giant's past challenges, there have been moments of doubt about otherwise confident companies. The sale of RCA's computer business and that of General Electric are brought to mind.

Also in doubt is the state of various leasing companies prominent among them. Intel, Comdisco and Transamerica. These companies may be forced to write down the value of IBM systems now out on lease by a substantial margin, thus decreasing, on paper at least, their wealth and ability.

The effect of the reduction in values of mid-size IBM main-

frames on users' balance sheets is not yet known. For many companies it is a prominent figure in accounts. If the computers become worthless, or nearly worthless, the result could be similar to that of a fire or other disaster.

There may be 5,000 IBM 148 and smaller computers installed in the US. The paper value of a typical system might \$100,000. Thus, with the announcement of the 4300 machines, \$500 million on the books of American business is jeopardised.

The impact of the 4300 on users' accounting will be revealed in coming weeks, as will the effects of the obsolescence of smaller IBM mainframes on leasing companies.

For investors who expect to hold their computer stocks for some time, political uncertainties abroad are much less important.

More revelations on illicit phone-tapping

TAP, the underground society of phone phreaks, is about to publish a method that is believed to open supposedly secret telephone circuits to unauthorized parties. The forthcoming report, due to appear in the TAP newsletter under the byline of Napoleon Solo, describes a circuit protection technique called "guard banding" that has been used to prevent vandals with blue boxes and other illicit gear from controlling inter-city phone lines.

According to Solo, switching computers that control trunk lines, called tandems, accept a 2,600 Hz signal only when that signal is mixed with noise of another frequency. The 2,600 Hz signal is used to indicate that an inter-city trunk line is not in use.

That same frequency is used by phone phreaks to trick telephone company apparatus into relinquishing control of long-distance lines.

The guard banding technique is used to prevent accidental or unauthorized triggering of tandems by music or the illegal devices built by phone phreaks. To shield the tandems from being tricked by an unauthorized 2,600 Hz tone, some switching computers require the tone to be mixed with another frequency.

The phone phreaks say that a 3,200 Hz signal, mixed with the

2,600 Hz tone, will open otherwise secure circuits to the outside world.

Once the guard band is simulated, phone phreaks can access autoanswer circuits. These circuits, which require special dialling codes sent to a tandem, permit silent tapping of inter-city phone calls.

AT&T says the circuits are used by authorised telephone company personnel to break into calls during emergencies to test lines. AT&T adds that the claims of the phone phreaks are false or exaggerated.

Proof that guard banding works is said to be found in many reports that phone phreaks have "staked tandems". Stacking of tandems is a procedure that phone phreaks use to link one tandem to another and thus weave a web of temporarily purloined telephone circuits across the country around the world.

The guard band technique is also used on Autovon, the telephone network used by the US military. Access to Autovon by phone phreaks has been previously reported, and military was reportedly used during the Vietnam war by phone phreaks to put soldiers in touch with friends and families, free of charge.

EXPENSIVE AND LENGTHY PROCESS FOR WESTERN SUPPLIER

Breaking into the Russian market

By Michael Aldrich of Redifon Computers

WESTERN computer manufacturers have long cast envious eyes on the Russian computer market. By Western standards, the Soviet Union is heavily under-computerised both in numbers of systems and range of applications, but although the country is committed to large expenditures on computing, there is no potential bonanza for Western suppliers.

The use of computers in Russia is tied to a plan that recognises their role in making government, industry and services more efficient. That plan is bound into the growth of the Russian computer industry and those of allied economies in Eastern Europe.

Through the Rjad plan for a unified range of East European computers and peripherals, the USSR has access to most of the computing power it needs in terms of mainframes but less so in terms of minicomputers.

For the Western supplier, except in unusual circumstances, there is no market for mainframes. Minicomputers are being bought for specific applications, but as local supplies increase, they will follow the path of the mainframes.

Because the USSR never embarked upon the widespread use of mainframes as in the West, the use of multiple mini and microcomputers instead of mainframes receives sympathetic attention. Easy to use systems with Cyrillic software, keyboards and printers are being installed to replace manual systems.

Just as in the West, technical computer skills are scarce commodities, and thus the attractions of simple terminal-driven systems with fast delivery and quick implementation are substantial.

In theory there is a market for large scale scientific mainframes of the kind produced by Control Data, but such sales are so beset by political considerations, restrictions and the need for approvals that in practice it is difficult to complete a sale.

Probably the best marketing opportunity lies with microcomputers. At the Informtech-88 exhibition in Moscow last month, mainframes were conspicuous by their absence, minicomputers were shown for particular applications, but microprocessors were in abundance.

Of the major suppliers at the exhibition, IBM gave pride of place to a laser printer, CII-HB 6160 a graph-plotting Level 6800, Burroughs displayed a Level 6800 word processing equipment, and Redifon, the only UK computer manufacturer present, had two large working R850 DDP configurations with telecommunications networks. The largest stand was that set up by Wang.

The novel aspect of the exhibition, however, was the presence of the major distributors of personal computers. With their long history of innovative use of equipment designed for other purposes, the Soviet Union could well be attracted to the development of personal computers for business application use. The low cost and high technology transfer benefits must be attractive.

Market entry in the USSR is expensive and lengthy for the

MANY Western manufacturers have looked longingly at Russia and Eastern Europe, hoping that as political tensions eased, considerable marketing opportunities would

appear. However, Russia aims to become self-sufficient and orders are likely to be only for specific applications. Last month Redifon Computers was the only UK com-

puter manufacturer to take part in the important Moscow show, Informtechnika 79. Here Michael Aldrich, Redifon marketing director, surveys the Russian scene.



ALDRICH... the Russians expect performance and are prepared to pay.

high levels of perception and acumen in selling advertising rights and driving hard bargains. Much equipment is being provided from Russia's home industries and from Eastern Europe.

Selected suppliers from the West will be installing computer systems specifically for the Olympics. British companies are well placed. ICL has received the order for two 2901s for the results systems (CW, February 22) and Redifon will be making announcements shortly. The business climate for British systems is good.

For the Olympics, the host equipment available on world markets is being acquired. The Soviet Union is demonstrating



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The takeover is also dependent on financial agreement and stockholder approval. In the meantime, WUI has indicated it will oppose any moves by Continental Telephone Co, which has bought 13% of outstanding WUI stock, to gain a controlling interest.

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Xerox aims to take over international telecoms firm

PLANS for a domestic data communications network, called XTEN, are still being pushed forward by Xerox, and the company is now aiming to get control of an international record carrier as well, WUI Inc (CW, February 1).

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End of govt contract review board

THE Renegotiation Board, a US government agency that reviews contracts between private business and certain government buyers, is expected to close its doors at the end of the month after 28 years of service. One force said to be behind the demolition of the small but powerful agency is the pressure from groups representing government contractors. A last-minute Congressional effort could give the board a temporary stay of execution.

Recently the board ordered IBM to pay \$42 million in excess profits back to the government. IBM has disputed this assessment, and is to go to court to fight the ruling. The action is based on an examination of IBM's computer leases in 1969 and 1970.

Other firms were assessed \$31 million this year, which included penalties for contracts involving 25 companies.

These actions, and others in the past, have angered opponents of the board, and it is believed that these companies, through lobbying organisations, played a role in its demise.

Government sources indicate that some of the strongest lobbying against the Renegotiation Board came from the Electronics Industry Association, the Machine and Allied Products Institute and representatives of the aerospace companies.

AMERICAN SCENE

BY HESH WIENER AND CAMERON DAVIS

Earnings rise, but the market falls

CONFUSION over oil supplies, relations with China, inflation, recession and American politics has left stock analysts in an untenable position.

A computer stock expert says, "One school of thought has the market really dropping. Another has it rising rapidly in anticipation of improved corporate earnings. In other words, nobody seems to know what's going on."

The circumstances are indeed puzzling. Computer companies and the majority of America's large corporations are experiencing an extremely profitable period. Corporate earnings, which jumped upward during the last quarter of 1978, are expected to remain high through the first quarter of 1979 and, for many companies, through mid-year.

Computer stocks have been sold lately, even IBM, which bobbed below 300 during mid-February, despite an impending stock split, the announcement of several attractive products and the expectation that the company would not be greatly affected by any recession that might occur.

Other computer companies have also lost value. In part because of the general Wall Street attitude and in part because of the challenge posed by IBM's 4300 and 8100 computers.

There is no question that the market positions of computer companies will depend on their responses to IBM's price/performance improvements. While IBM's competitors are resourceful, and have always responded to the giant's past challenges, there have been moments of doubt among otherwise confident companies. The sale of RCA's computer business and that of General Electric are brought to mind.

Also in doubt is the state of various leasing companies, prominent among them Ite, Condisco and Transamerica. These companies may be forced to write down the value of IBM systems now out on lease by a substantial margin, thus decreasing, on paper at least, their wealth and stability.

The effect of the reduction in values of mid-size IBM main-

frames on users' balance sheets is not yet known. For many companies it is a prominent item in accounts. If the computers become worthless, or nearly worthless, the result could be similar to that of a fire or other disaster.

There may be 5,000 IBM 148 and smaller computers installed in the US. The paper value of a typical system might \$100,000. Thus, with the announcement of the 4300 machine, \$500 million on the books of American business is jeopardised.

The impact of the 4300 on users' accounting will be revealed in coming weeks, as will the effects of the obsolescence of smaller IBM mainframes on leasing companies.

For investors who expect to hold their computer stocks for some time, political uncertainties abroad are much less important.

74 laws on information

DURING the 95th session of the US Congress, 74 new laws were enacted that affect the nation's information policy. Few of the laws, however, have information issues as their main concern.

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"The new technology gives us the opportunity to make better use of information to improve the quality of life and the quality of government," Rose remarks.

Japanese package threat

NEXT target for that remorseless commercial machine, Japan Inc. is the US packaged application software market, and within three years the Japanese will arrive in force.

This is the view of John Imley, Jr., 1978 president of ADAPSO, the Association of Data Processing Service Organisations, and president of Management Sciences America Inc. of Atlanta.

His views were crystallised on a 10-day trip to Japan, where he addressed 700 specialists at the Japan Software Industry Association.

"In discussions I found much to my surprise, that there is no acceptance of application software," he said. "Up to now, he noted, the Japanese had all their application software custom-written. But now that

Fujitsu and Hitachi were entering the low end of the mainframe market, which embraced first time users, they realised that they had to have application packages to sell their machines.

"As a result, MITI is to finance the development of packages (CWI, September 14, 1978). With government support, Japanese productivity and the launch of small computers, they should begin to market in the US within three years."

Through acquisitions, reciprocal agreements and joint ventures, the time would be even shorter. There is no reason for them not to be successful in the production of effective software products, and their competition will certainly be fiercer.

More revelations on illicit phone-tapping

TAP, the underground society of phone phreaks, is about to publish a method that is believed to open supposedly secret telephone circuits to unauthorised parties. The forthcoming report, due in April in the TAP newsletter under the byline of Napoleon Solu, describes a circuit protection technique called "guard banding" that has been used to prevent vandals with blue boxes and other illicit gear from controlling inter-city phone lines.

According to Solu, switching computers that control trunk lines, called tandems, accept a 2,600 Hz signal only when that signal is mixed with noise of another frequency. The 2,600 Hz signal is used to indicate that an inter-city trunk line is not in use.

That same frequency is used by phone phreaks to trick telephone company apparatus into relinquishing control of long-distance lines.

The guard banding technique is used to prevent accidental or unauthorised triggering of tandems by music or the illegal devices built by phone phreaks. To shield the tandems from being tricked by an unauthorised 2,600 Hz tone, some switching computers require the tone to be mixed with another frequency.

The phreaks say that a 3,200 Hz signal, mixed with the

2,600 Hz tone, will open otherwise secure circuits to the outside world.

Once the guard band is disabled, phone phreaks can access autoverify circuits. These circuits, which require special dialling codes sent to a tandem, permit silent tapping of long-distance phone calls.

AT&T says the circuits used by authorised telephone company personnel to break into calls during emergencies are not the same as the circuits claimed by the phreaks to be fake or exaggerated.

Proof that guard banding works is said to be found in many reports that phreaks have "stacked the dials". Stacking of tandems is a procedure that phone phreaks use to link one tandem to another and thus weave a web of temporarily patched telephone circuits across the country around the world.

The guard band technique also used on Autovox, the telephone network used by the US military. Access to Autovox by phone phreaks has been previously reported, and was reportedly used during the Vietnam war by phone phreaks to put soldiers in touch with friends and families, free of charge.

EXPENSIVE AND LENGTHY PROCESS FOR WESTERN SUPPLIER

Breaking into the Russian market

By Michael Aldrich of Redifon Computers

WESTERN computer manufacturers have long cast envious eyes on the Russian computer market. By Western standards, the Soviet Union is heavily under-computerised both in numbers of systems and range of applications, but although the country is committed to large expenditures on computing, there is no political bonanza for Western suppliers.

The use of computers in Russia is tied to a plan that recognises their role in making government, industry and services more efficient. That plan is bound into the growth of the Russian computer industry and those of allied economies in Eastern Europe.

Through the Rjad plan for a unified range of East European computers and peripherals, the USSR has access to most of the computing power it needs in terms of mainframes but less so in terms of minicomputers.

For the Western supplier, except in unusual circumstances, there is no market for mainframes. Minicomputers are being bought for specific applications, but as local supplies increase, they will follow the path of the mainframes.

Because the USSR never embarked upon the widespread use of mainframes as in the West, the use of multiple mini and microcomputers instead of mainframes receives sympathetic attention. Easy to use systems with Cyrillic software, keyboards and printers are being installed to replace manual systems.

Just as in the West, technical computer skills are scarce commodities, and thus the attractions of simple terminal-driven systems with fast delivery and quick implementation are substantial.

In theory there is a market for large scale scientific mainframes of the kind produced by Control Data, but such sales are so beset by political considerations, restrictions and the need for approval, that in practice it is difficult to complete a sale.

Probably the best marketing opportunity lies with microcomputers. At the Informtechnika exhibition in Moscow last month, mainframes were conspicuous by their absence, but microcomputers were shown for particular applications, but microprocessors were in abundance.

Of the major suppliers at the exhibition, IBM gave pride of place to a laser printer, CII-HB had a graph-plotting Level 81/60, Burroughs displayed a 680 and word processing equipment, and Redifon, the only UK computer manufacturer present, had two large working R850 DDP configurations with telecommunications networks. The largest stand was that set up by Wang.

The novel aspect of the exhibition, however, was the presence of the major distributors of personal computers. With their long history of innovative use of equipment designed for other purposes, the Soviet Union could well be attracted to the development of personal computers for business applications. The low cost and high technology transfer benefits must be attractive. Market entry in the USSR is expensive and lengthy for the

MANY Western manufacturers have looked longingly at Russia and Eastern Europe, hoping that as political tensions eased, considerable marketing opportunities would

appear. However, Russia aims to become self-sufficient and orders are likely to be only for specific applications. Last month Redifon Computers was the only UK com-

puter manufacturer to take part in the important Moscow show, Informtechnika 79. Here Michael Aldrich, Redifon marketing director, surveys the Russian scene.



ALDRICH... the Russians expect performance and are prepared to pay for it.

high levels of perception and acumen in selling advertising rights and driving hard bargains. Much equipment is being provided from Russia's home industries and from Eastern Europe.

Selected suppliers from the West will be installing computer systems specifically for the Olympics. British companies, well-placed, ICL has received a order for two 2301s for the results systems (CWI, February 22) and Redifon will be making announcements shortly. The business climate for British systems is good.



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MARKETVIEW

BY FRED LAMOND

Last month, IBM's Data Processing Division started the industry with the announcement of the 4331 and 4341, which offer a dramatic improvement in performance/cost ratio over the medium-size 370 models that they replace in IBM's catalogue.

Why is IBM being so generous and offering its small to medium users so much more power for less money? Is it risking a drop in rental revenues from 370/125 users upgrading to a cheaper 4331, and 370/148 users upgrading to a cheaper 4341?

In this Marketview, Fred Lamond explores the strategic thinking behind the new announcement, and the significance of some of other features, notably the System IPO/E.

Why is IBM being so generous?

WHEN IBM divided its computer marketing between the Data Processing Division and the General Systems Division in 1975, GSD was given the task of broadening the IBM customer base at the low end, and DPD the existing 360 and 370 user base to defend and develop.

As an autonomous profit centre within IBM, DPD still wants to grow, preferably by IBM's standard growth rates of 15 to 20% per year. But it cannot grow downwards among smaller users because that is GSD territory, nor very far sideways into competitors' territory since it already has between 80% and 70% of the world's general purpose computer market. Its only hope for long term growth thus lies in increasing the revenue yield from its existing customer base, by persuading them to computerise ever more applications requiring ever more hardware and chargeable program products.

From this point of view, the growth rate of DPD's existing customers during the period 1975 to 1977 was far from satisfactory, especially in the small to medium size systems range. To understand why, IBM appears to have commissioned a number of surveys, whose results have trickled out at various lectures and seminars.

The surveys showed that, among large users at least, there is no shortage of new applications waiting to be computerised. On the contrary, the rising younger generation of user department managers has grown up with computers, understands better how they can help improve departmental efficiency and response and is sending a steadily increasing stream of requests for new DP applications to central DP departments.

It is these central DP departments that have been unable to keep up with the requests. Among the top 500 US corporations listed in Fortune magazine, the average delay quoted by DP departments for computerising a new application rose from two years in 1975 to four years in 1978 (figures quoted by Dr James Martin, formerly of the IBM Systems Research Institute, at his London seminar last July).

And the reasons why DP departments have been unable to computerise new applications as fast as requests were coming in is because 80% of their programmers' time was employed in maintaining existing program suites, in large part to adapt their JCLs to the latest operating system releases, or as part of a JCL conversion from, say, DOS or DOS/VSE to OS/VS-1.

Programmer productivity in applications programs by the same number of programmers. Another more recent aid to customer programmer productivity developed by DPD is the System Installation Productivity Option (IPO) first offered on large 370/158, 168 and 390 series systems.

The trouble with both these productivity aids is that they require an initial investment in more main memory and/or disc backing storage, particularly by the installation whose resources are already

thus the main bottleneck on DPD customer installations' growth, and DPD has devoted its best brains since 1975 to finding ways of improving this.

One important aid to programmer productivity is the application-independent database. By 1975, some of the most successful IMS pioneer users had found that on database oriented applications programs, maintenance dropped from 80% to 20% of programmers' time, thus leading in turn to a fourfold increase in the output of new

fully stretched. This is obviously true of databases — especially IMS/VS — but also of the System IPOs, since these standardised packages will almost always contain more SCP modules than any one individual user would require at any one time of his working day, or ever.

More main memory and/or backing storage has hitherto required higher rentals or an additional purchase investment. It is in order to help its users break out of the vicious circle of low programmer productivity

thereby increasing new applications output from the same team. But to save system programmers the feeling of being demoted, IBM sales engineers might suggest to the DP manager that they be given the more challenging task of designing and implementing an applications-independent database, for which the installation now has enough spare memory capacity and processor power.

The implementation of that database will on past experience increase the same programming

team's productivity fourfold. Their greatly increased output of new applications will increase user departments' and top management's goodwill to the DP department — if they are an autonomous profit centre — its users were paying.

In 1977, it more than doubled the power and memory available to 370/148, 158 and 168 users for the same price if they converted to 3031, 3032 or 3033 systems. Now it is offering three to four times the power and memory available at existing rentals to 370/116, 126, 136, 148 and GSD System 3 users if they convert to the new 4331 or 4341.

In doing so, DPD is running the risk that some users might prefer to use the performance/cost ratio improvement to cut their rentals rather than increase their configuration power. But in the absence of the 4300 series announcement, such users might well have deserted the IBM fold and ordered a cheaper Intel or other PCM system. Instead, sooner accept a lower rental from such users than lose them altogether.

Most IBM users will not react this way. Having, at equal power, consistently paid 20 per cent more for their hardware until now than other manufacturers' users for the sake of the additional IBM software and support, they are expansion-minded, and will prefer additional power and memory capacity to lower rentals.

Most small to medium 370 class, and some GSD System 3 users, can therefore be expected to order over the next two years a 4331 or 4341 system with anything from 512K to 1.5M bytes more main memory capacity than the system that it will be replacing. As soon as the system is installed, some of the additional memory capacity will be used immediately to implement:

- DOS/VSE (which requires 180K minimum main memory residence) to replace DOS/VS (96K memory residence).
- A prepackaged System IPO/E which requires a minimum 512K processor in which to run. If data communications network control and/or database modules are included.

DPD will also encourage 4341 users to move rapidly from a pure DOS/VSE to a VM/DOS/VSE System IPO/E, that will allow end users to use the DP system for personal computing under the VM Conversational Monitor System and its APL and Basic interpreters.

Use of a System IPO/E will immediately free the system programmer's time for other work

and low applications growth, that DPD has now for the second time "given away" a substantial amount of additional processor power and main memory for the same rentals as its users were paying.

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signed at least as much to be suitable dispersed or distributed processing satellite on additional sites within large corporations and institutions, mostly directly in end user departments.

That is why the 4331 has been specifically designed to require no air conditioning if it is plugged into ordinary 13 amp ring mains. Its integrated data communications adapter and the backing ACF/VTAME program product have been designed to allow the 4331 to be easily an online satellite system in a larger host, as a small host within an SNA communications environment.

The 4331 will thus take its place as the 6100 Informatics System's bigger brother, and compete both with IBM CSD Series 1 and System 38, and with other business minis.

It will have the advantage over its competitors of source program compatibility with larger 370 or 3030 series host systems, not only via VSE or RPG II, but also via APL, VSE job control language, Lurper DP departments and a equip dispersed 4331 systems with ready-made applications programs previously running on the central system.

Alternatively, dispersed 4331 systems can run under the best VM System IPO/E that supports only the Conversational Monitor System (CMS) and no operating system. They then allow any of their connected terminals to be used for personal computing in APL or Basic or for interactive development of Cobol programs directly by user department personnel, as well as to interrogate a host system files interactively.

At a later date, DPD plans also to sell dedicated 4331-based "applications machines", which will be supplied by IBM pre-figured and prepackaged with a specific program suite that they will run exclusively.

In this way DPD hopes to get many 4331 systems through large corporations and institutions without encountering the proliferation of mini-DP departments equipped with their own DOS/VSE professionals. Such professionals are scarce, and the dispersed 4331 systems will depend on them, their security would act as a restraint on the number of dispersed 4331 systems that could be set up in large corporations and in subsequent growth.

The announcement of the 4300 series, with its performance/cost ratio as a part of a very aggressive strategy, in which the System IPO/E will play a major role. The most important part of this strategy has been the incultation among IBM users of the idea of a "distributed" memory and processor power, rather than the "centralised" memory and processor power of the past.

It is a strategy which will find its full expression in the 4300 series, simply to succeed earlier System 3, 360 or 370 processors. The 4331, at least, has been de-

Major facelift for Réalité business system

A MAJOR facelift for the Réalité business system has been announced by France's number two minicomputer Intertechnique. Originally based on licences from Microdata of Irvine, California, the Réalité-20 has been reborn with major enhancements as the Réalité-2000.

Keeping pace with the general progression of the market, the new machine offers more power at 80 per cent of the price of a comparable Réalité-20 model, and makes use of multiple microprocessors as

peripheral controllers. It also offers a massive extension to main memory: the maximum is now 512K words, compared with 32K words on the superseded model. Communication is also greatly enhanced, with the previous 2780 communications protocol supplemented with support for up to four X25 packet-switching lines for synchronous communication, and a concentrator for four asynchronous X25 lines.

It supports up to 32 terminals, is programmed in the proprietary "Francals," the

French version of "English" offered on the Microdata Réalité and Roysale sold by CMC in the UK, and also includes a microcoded Business Basic which is claimed to be very fast.

The computer division of Intertechnique has sold about 5,000 minicomputers since it was started by its large electronic equipment and instrumentation parent, and in 1978 did business worth about 181 million francs, £21.5 million, including 104 million francs on computer systems.

European president complains of unfairness

French policy on IBM still worries Maisonrouge

UNDERLINING IBM's concern at the imbalance between its French and its other European manufacturing operations (CWI, February 15), IBM Europe president Jacques Maisonrouge returned to the subject in an interview with the French weekly *Ordinateurs*.

"IBM France is the only company within our group which has a consistently favourable balance of payments with other companies within IBM Europe, and it has been that way for a long time."

Needless to say, it is impossible for all our subsidiaries to have a favourable balance of

need to adjust our balance of manufacture, we have decided to establish a new plant south of Rome," said Maisonrouge.

In the interview, he also returned to the theme of government support for national computer industries.

"We understand the French government's desire, and that of other governments, to create a local data processing industry. But we have four plants, including a microelectronics facility and a research laboratory, which could easily be taken over by France at a time of national emergency."

"It seems unfortunate that after 12 years of support for CII and CII-IBM, the public sector market in France should still be closed to a company like IBM which manufactures in France. This inevitably reduces the work-load at the Montpellier factory, which we established there at the bidding of the government in pursuance of its policy of decentralisation."

"Given that 21,500 Frenchmen work for IBM France, a company managed by French nationals, manufacturing in France, with a 1,300-employee research establishment at La Gaudie, and the biggest French semiconductor plant in France at Essonne, we do not understand why we are told, 'because you are IBM, you cannot have access to the public sector market.'"

"It could in part be that we are a subsidiary of a US multinational, but it is also because we do not happen to be the privileged supplier which the government has chosen to assist. Do not forget that CII-Honeywell Bull is 47% American. We do not think it is fair to make a distinction on the basis of the proportion of French capital in the company. The contribution to the national economy should be taken into account."

"People criticise us over the 'Buy-American Act', saying that the US government does not buy any French products, so it is reasonable in return for us to buy only French products. But this argument is based on false premises. In fact, if a French company manufactures in the US it will have no problem in

selling its products to the Federal government."

ICL Inc has in fact sold 1500 series systems to agencies of the US government on the basis that they are manufactured in Ulster, New York.

In the interview, Maisonrouge also stated that it was IBM's policy to manufacture in Europe everything that was sold there,

and he explained that in order to get the same economies of scale as in its US factories, each plant and each country had to specialise in a narrow range of products. He commented on the need to keep European manufacturing costs as low as those in the US, and said that IBM was having some difficulty at present in achieving that.

Japanese PTT resists open tender pressure

THE Japanese public telephone company Nippon Telephone and Telegraph is resisting pressure from the government to open up more of its equipment procurement to tender.

At present only about \$17 million of NTT's annual \$3,100 million expenditure on capital goods and supplies goes to non-Japanese companies and the Japanese government, stung by criticisms of its enormous balance of trade surplus with most of the developed world, wants NTT to increase this figure to \$300 million.

NTT believes it runs the most efficient and fault-free phone system in the world, but if government pressure becomes irresistible, open tender could provide unexpected possibilities for a breakthrough for Britain's System X all-digital telephone switching system.

American companies are, however, likely to be the principal beneficiaries, since the US government is spearheading the pressure on Tokyo to relax import restrictions.

ICL 2956s for Papuan firm

THE remotest ICL 2956s in the world are likely to be the two on order for Bougainville Copper of Papua New Guinea. Underlining the success of ICL's DME/2 migration strategy gnt 2903 series users, the mining company is to upgrade to the new

machines, introduced last autumn (CW, October 10, 1978), from two 2904s. The machines will be installed on Bougainville Island, which is due east of the main island of New Guinea and 1,500 miles north-east of Australia's Great Barrier Reef.

Word processor from W. Germany

WEST GERMAN office computer and small business system manufacturer Computer Technik Müller has introduced a stand-alone word processor. Priced at Dm 22,900, about

£6,000, the system includes a processor, keyboard, minifloppy drive, printer and operating software.

It is designed to compete with systems costing up to Dm 40,000.

Memories are made of these

MAISONROUGE... a serious problem for us.

exports to imports at the same time. But the fact remains that our business is growing faster in Italy, in the UK and in Germany than it is in France. So much so that, within our group, France enjoys an even more privileged position in terms of value added against business done.

"This creates a serious problem for us. In Italy, for example, the government and the unions say we have a balance of trade deficit: it is necessary to build new factories, establish new research facilities. It is noteworthy that the main pressure on us from Italian unions is for more manufacture, more research in Italy."

"As a result, in view of the

Franco-US deals completed

TWO Franco-American deals initiated last year (CW, October 26, 1978) are now completed. Plotter specialist Benson has acquired the graphics division of Varian Associates, which now becomes Benson-Varian Inc and a 100-per cent subsidiary of the French company, with Varian in turn taking a 25 per cent stake in Benson SA in the form of newly issued shares. And Matra of France and Harris of the US have formed Matra-Harris Semiconductors, 51 per cent owned by Matra, which will invest 50 million francs over five years. The Harris contribution will be CMOS expertise valued at 48 million francs, and the French government will put up 100 million francs.

Norwegian ATC order for Datasab

SWEDEN's national computer company, Datasab, has received a 7 million Krone order from Norway for an air traffic control system based on dual Casio 932 computers for the Stevanger control centre in northern Norway. The system will have combined primary and secondary radar and nine operator positions, and the contract includes orders for the equipment of three further centres. It was placed by the Norwegian telecommunications administration.

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Digital Simulation	12-16 November
Management Systems	19-23 November
Auditing and Security of Computer Systems	28-30 November
Data Base Design Workshop	3-7 December
Computer Networks	10-14 December

From 1979 on some of the advanced courses developed by the Control Data Institute will regularly be held at SZAMOK.

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Distributed Processing with Minicomputers	3-4 May
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Structured Testing	8-9 October
Computer Performance Measurement	15-17 October

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US govt settles on interface standard

DESPITE fierce opposition from most of the US mainframe manufacturers, the US government has adopted as its required computer input-output interface a standard which is essentially based on the IBM 380

Japanese dispute

pricing of 4300 THE hold-up in the announcement of the IBM 4300 line in Japan (CW, February 22) resulted from disagreement between IBM and the Japanese Ministry of International Trade and Industry over pricing of the machines. IBM set a Japanese price somewhere between 1.2 and 1.8 times the US dollar price in the US, and Japanese sources believe that IBM wants to price the 4300s at the low end of the price multiplier while MITI wants the machines priced at the high end to minimise the impact on domestic Japanese manufacturers.

and 370 channel. All Federal computer system procurements made after December 13 this year will be required to incorporate the standard interface. While US mainframe manufacturers, headed by Honeywell, resisted the standard as restrictive of competition and innovation, suppliers of plug-compatible and independent peripheral equipment are delighted with the decision, which they see as increasing competition in their sector of the market. Commenting on the new standard, Bob Fertig of Advanced Computer Techniques, New York, declared it to be obsolete. "It should have been passed 10 years ago, when it might have been useful," he told Computer Weekly. "Our Corporate Technology Committee has looked into it, and we find that the IBM 4300, although 370-compatible, has a new I/O protocol, so the government standard is ineffective. The final version of the standard is so watered down anyway that it is likely to be ineffective. For example, it excludes minis, but what is a mini? IBM 4331? System 38? It could hurt vendors dependent on government business, particularly Digital Equipment with the DECsystem 10 and 20, Univac 1100 and Honeywell."

Underlining the irrelevance of the standard, Fertig noted that his group was expecting a new disc with the forthcoming top-end IBM H-series which would have double the track density of the new 570-Magabyte 3370 disc drive. "The transfer rate of this would be so high that it could not be attached to the standard channel; I doubt if even the 3370 can be attached. "The 370 channels were hard-wired, but the channels on the 4300 are 'soft,' which means that IBM can microprogram them, along with the controllers, for a new protocol overnight."

Last chance to take up the big challenge

NEARLY 200 teams have entered for the Computestars 79 competition, with entries spread well over the country. However, the response, from Wales and Scotland has been low, so more challengers are needed from North of the Border and from the Principality and the South-West to ensure heats can be held in those areas. This is the last chance to enter the country's biggest athletic contest for computer people. Complete the form below and send it with the entry fee to Computestars, 117b High Street, Croydon, Surrey. Cheques should be made payable to Computestars. The contest is jointly sponsored by Wright Air Conditioning and Computer Weekly.

All of last year's winners are defending their titles and there is going to be some tough competition to win places in the finals at Crystal Palace. The dates of most of the heats have now been fixed and are as follows: Midlands, Alexander Stadium, Birmingham, April 8; Thames South, The Sports Centre, Crawley, Sussex, April 29; and North-East, Westcliffe Mount Sports Centre, Cleckheaton, near Leeds, May 13. The dates and venue for Thames North-West and East Anglia have still to be settled. The South-West heat will be at the Whitechurch Sports Centre, Bristol, on April 22, and the Scottish heat will be at the Meadowbank Stadium, Edinburgh, on May 20. Both of these heats

ENTRY FORM

We have read and accept the conditions of entry for the Computestars 79 competition and would like to enter . . . men's teams . . . woman's teams.

Company

Name of unit

Number of staff in unit

Address

Name of contact for team (s)

Telephone number Extension

Signature of manager in charge of unit

Position held

Enclosed is £ to cover the entry fee for men's and/or women's teams. Cheques should be made payable to Computestars. The team would like to compete in the following region: NORTH EAST NORTH WEST MIDLANDS SOUTH WEST EAST ANGLIA THAMES NORTH WEST THAMES SOUTH SCOTLAND.

Please circle appropriate centre. In all matters relating to the rules and the competition, the decision of the organiser is final. Please send this entry form to: Computestars, 117b High Street, Croydon, Surrey. Tel: 01-888 6680.



Amdahl systems under test in Dublin (see below).

Amdahl's Irish assembly plant gets off to encouraging start

THERE are currently five machines on test at Amdahl's assembly plant in Dublin, shown above, and the company is planning to build 30 of its 470V series mainframes there this year. At present the V/4, V/6 models are being built, but V/7s and V/8s will follow in June. Since production began last summer 12 machines have been shipped from the plant, which builds only for the European market and will meet full European demand for some time. Amdahl currently has 28 installations in Europe: six in the UK, six in Italy, four in West Germany, where the company first opened, three in France, three in Norway, and two each in Switzerland and Denmark.

It is noteworthy that despite setting up first in West Germany, Amdahl has not been spectacularly successful there, with only one commercial customer, which suggests that Siemens may have difficulty in persuading many German IBM users to switch to Fujitsu's M-series, renamed for local consumption the 7800 line. However, Siemens' primary target is understood to be its own users who are outgrowing the 7700 line.

The Dublin plant, with 92 employees and only one departure so far, plans to be employing over 200 by the end of the year, and over 400 once its new 90,000 square foot plant under construction at Swords, County Dublin, is completed.

Much of the work in Dublin is still final assembly and test, but the consoles, incorporating in Keronix minicomputer and fixed disc, and the power frame assembly are now manufactured.

Even at Sunnyvale, Amdahl still puts together machines including some modules made in Japan by Fujitsu, and some machines are still built almost entirely by Fujitsu. In total, Fujitsu estimates that it still does 50% of Amdahl manufacture. At present all Japanese assemblies come to Ireland via Sunnyvale, but in the future

they will come direct. Tokyo still continuing with Thomas about incorporating Thomas' memories in the Irish machines, which would have cut the duty on Irish-built machines shipped within EEC, but no agreement has been reached.

Amdahl reports that rates are much lower than boards assembled in Dublin in Sunnyvale, and Harry L. L. who heads the Irish operation, is enthusiastic about Irish workforce.

"The labour force is excellent and they have been retrained," he says. "Workers are more willing here than in Sunnyvale, where they can always get another job across the road. Labour costs are also lower, but this stage, so is productivity."

"The major shortage is of highly trained systems test people; we need people with five to 10 years' experience on IBM equipment, and at present, they are all coming from the UK. We are training graduates here, but it will take time. Industrial Development Authority training grants are vital for this."

According to Mueller, the biggest problems so far have related to public utilities. "Electricity, post office and transport strikes have caused us difficulties," he says.

The significance of distributed processing, which is modifying IBM's view of the world as much if not as rapidly as everyone else's, is that users will often have more power at their elbow than the ability merely to request services.

One other ingredient, which might be added to IBM's definition, is that of diversity. While the network structure itself must be unified and coherent, the devices attached may be diverse and often are, in one way or another, incompatible with one another.

This incompatibility is the inevitable result of a competitive market and a rapid rate of technological advance, avoided only by those prepared to buy all their equipment from a single supplier.

We can expect the devices connected to the network to include not only screen and keyboard terminals, remote batch terminals, general purpose and minicomputers, which now constitute the majority of the population.

Increasingly there will also be devices which handle text, such as communications word processors — or images, like facsimile transmitters, and even

Networks can be a crucial weapon in the armoury

By Anthony Gunton

THE position of data communications networks can be likened to the position of file management systems before the advent of database techniques. Databases add to the basic ability to access, process and manage data. Similarly, the currently favoured network architectures promise to add, to the ability to transport data, the opportunity to manage both the network and the data which it transports.

If you like, the data communications network is becoming an information handling tool rather than purely a transport service. However, databases are not for everyone; nor will these intelligent networks suit everyone. They will not be cheap, but those who implement them will not do so because they save money, which they often will not, but more probably because they make possible a better level of service to users.

Let us begin with a definition. Typically, in an organisation there will be a large number of users of information or of services. They may have terminal devices or small stand-alone computers. Then there will be shared facilities, often one or more

voice response systems. The reason why all these devices should share the same network is, quite simply, that the cost and inconvenience of establishing separate networks for each will be prohibitive, particularly when all of them produce digitally encoded information.

Considerable interest has been generated in networking over the past few years, particularly by the success of Arpanet and of the value-added networks it spawned such as Grapnet and Telenet.

However, it must be said that success has so far been measured in technical rather than commercial terms. Packet switching, on which most of these intelligent networks are based, is still an expensive technology.

It is now on the verge of demonstrating its commercial viability in the public domain and, possibly, in the private domain also. British Steel's experience with its internal network will no doubt be watched with great interest.

In fact what these packet switching networks do is nothing new. The airlines' Sita network, for example, has many of the features commonly associated with packet-switching networks. So do the time sharing networks such as Tymshare's Tymnet and GE's Mark III.

What is significant is that the features of these application-specific networks have been incorporated into a general purpose scheme of great versatility. This versatility derives, to a large extent, from the multi-layered structure which has been adopted also in the network architectures of the computer manufacturers.

It is this that makes them complex in comparison with the previous generation of networks, using protocols such as IBM's BSC and ICL's XBM, and also what gives them their power and their ability to cope with today's systems, where an increasing variety of devices communicate in a more complex fashion.

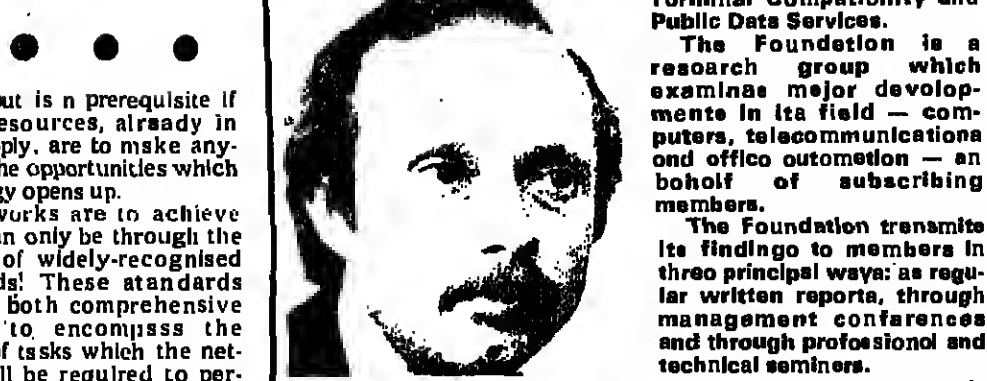
One can reasonably assume that any management services manager would wish to have such a tool at his disposal. What then are the issues which need to be resolved before an intelligent network will be a practical proposition for all, not just the pioneers?

Firstly, the enterprise and the attitudes of the PTT, reflected in tariff and regulatory policy, will have a profound impact. This is too large a subject to do more than touch on here. Suffice it to say that PTTs have the power to determine the pace that modern networking techniques are taken up and also to determine who can participate — whether it is only the large organisations who can build their own network or everyone with a network problem.

No less important are the other established suppliers of data communications products, the computer manufacturers. Their network architectures promise the user a new level of capabilities. Will this be realised, or will we see another round of defensive in-fighting, in which each supplier's main objective seems to be to lock his users in, rather than to solve system problems? It is clear that many suppliers

REPORTS FROM THE FOUNDATION - 3

This Computer Weekly series is based on reports made by the Butler Cox Foundation research group, which examines a variety of topics relating to the development and use of information technology. Anthony Gunton is a partner in Butler Cox and Partners and heads the information and research unit. He is the author of the Butler Cox Foundation reports on Developments in Data Networks, Terminal Compatibility and Public Data Services.



The Foundation is a research group which examines major developments in its field — computers, telecommunications and office automation — on behalf of subscribing members. The Foundation transmits its findings to members in three principal ways: as regular written reports, through management conferences and through professional and technical seminars.

Perhaps the most important of these will be the ability to spend more time on user problems and less on purely technical difficulties of logistics, compatibility and so on. For the management services department, the network can be a crucial weapon in the armoury, in a battle which is being waged on a fast-widening front.

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INTERNATIONAL NEWS IN BRIEF

CDC partner in India

AN OLD Madras-based plantation company, A. V. Thomas, is to be Control Data's partner in marketing computers in India. Although CDC has had a 3600 at the Tata Institute for Fundamental Research in Bombay since 1964 (CW, August 1, 1974) it is one of the last US mainframes to announce a formal link with an Indian company to sell its machines.

Swiss first

FIRST Swiss order for dual-processor V-8590, currently the largest NCR mainframe available for delivery, has come from the Cantonal Bank of Schwyz, Switzerland. It replaces an NCR century 201 and will support 58 terminals at 21 locations.

SA subsidiary

MEMOREX is running down its subsidiary in South Africa and its products are to be distributed there by the former subsidiary of Computer Resale Brokers, South African Computer Resale Brokers.

COMPUTER WEEKLY INTERNATIONAL

New Robotron mainframe on show at Leipzig

HIGHLIGHT of this year's Leipzig Fair in the German Democratic Republic is the new Robotron ES-1055 mainframe, the largest machine currently available in the Eastern bloc's Rjad unified range.

The fair, which has been running all this week, is the most important showcase for the East German manufacturer's computer products, and Robotron has been taking full advantage of it.

The ES-1055, which has a specification almost identical to that of the IBM 370/148, with two Megabytes maximum main

memory, is nevertheless claimed to be closer to the 370/158.

The company has been demonstrating a railway seat reservation system developed for the Deutsche Reichsbahn and the railways of other Comecon countries, which handles couchette and bed reservations as well as seats.

The operating system on the 1055 is the standard Rjad DS/ES, with enhancements, and the database management system, called DBS/R, is understood to be akin to IBM's Bill of Materials Processor.

The Robotron Daro 1700 line of office computers has been the most successful GDR computer product in Western Europe, and on show are the 1750, with floppy disc backing and magnetic ledger cards, the 1720, with magnetic ledger cards, and the 1711, involving machine.

The 1711 is a micro-housed system with 512 bytes of control memory, and 16 words of user memory, controlling an electric typewriter. The K1000 series is a line of micro-computers which use LSI MOS semiconductor processor and memory circuits.



US index to combat insurance fire frauds

INSURANCE frauds by users are to be combated in the US with a computer index set up by the American Insurance Institute, the trade association for 90% of US fire insurers.

Data on all fire claims in excess of \$500 will be fed into the system in order to pinpoint property owners who have more than one policy on a building who keep having fires at different properties.

According to Gerald Murphy, manager of the Property Insurance Loss Register, this should help reduce the estimated \$1 million that arson costs US insurance companies each year. "Arson for profit has made epidemic proportions," says McDonnell Douglas, who awarded a \$1.1 million contract to design and install these

China orders communications equipment

DIGITAL pulse code modulation microwave communications equipment has been ordered from Nippon Electric by China. It will be used in monitoring and controlling hydroelectric power distribution and irrigation, and in flood prevention, in the area between Beijing, Shanghai and Wuhan. Up to 450 channels will be provided over a 2,500 km route.

Japan's Ministry of International Trade and Industry is planning to seek special approval for the deal from CoCom, which monitors Western exports to Communist countries.

PoS increase

DURING 1978 the number of NCR supermarket point-of-sale systems in the US with Universal Product Code scanning increased from 50 to 224.

£850,000 order from Libya

THE biggest contract for CMC-UK, the Hemel Hempstead-based subsidiary of Microdata of California, has been awarded by Libya's Public Social Security Institute. Worth £850,000, the order is for five Realtime Royale small business systems and for five key-to-disc systems.

The Royales, which are built around Microdata minicomputers, will each support six terminals, and all the terminals and keyboards will support both Roman and Arabic alphabets.

One Royale and one key-to-disc system will be installed in each of five regional centres, handling registration, contributions and benefits for about three million people.

Italian firm to produce Zilog Z8000

THE Z8000, 16-bit microprocessor from Zilog is to have a European second source, following an agreement in principle for Italian company SGS-ATES to produce the device. SGS, already a second source for the Z80 micro, will be supplied with masks, test data and other technical information by Zilog for the production of the Z8000 CPU chip, plus the memory management chip, a FIFO buffer memory, a counter and parallel I/O chip, a serial I/O chip, a buffer unit and a universal peripheral controller.

Also included in the agreement is SGS' rights to second source the single chip Z8 microcomputer. Zilog is due to begin sampling of this part during the second quarter of this year. SGS will not get rights to the peripheral devices being designed by AMD as part of its own second source agreement with Zilog (CW, September 7, 1978), but according to European director Pepe Piedra, SGS will not go short of these components.

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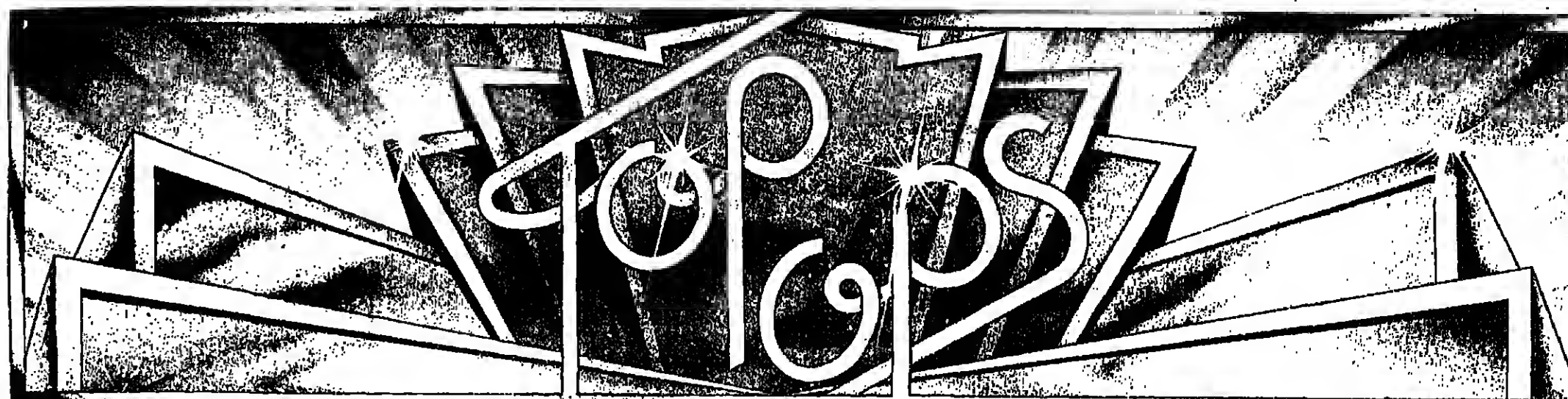
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Permanent ICL 1905T — GEORGE II or II+ LONDON NW10
Snr. Op. required with 2 yrs. exp. of both VME/B or DME
and GII and MANUAL although either O.K. Salary £4-4,600.
Call Elaine or Sally.

Permanent IBM 360/50 — DOS GRASP LONDON WC2
Bureau looking for Op. with 1-2 yrs. DOS exp. 3 shifts.
Salary £4 - 4,500 incl. Call Sally or Elaine.

Permanent 2 x ICL 9900 & ICL 1905T LONDON SW6
2 Snr. Op. required with 2 years exp. of both VME/B or DME
and GII and MANUAL although either O.K. Salary £4-4,600.
Call Elaine or Sally.

Permanent IBM SYSTEM 3 MODEL 8 — DAYS ONLY EYDENHAM, SE26
Co. looking for Op. with 6-12 mths Sys 3 exp. to work
days only. Data control & job scheduling exp. pref.
Salary £4,000. Call Sally or Elaine.

PERMANENT JOB VACANCIES

Knight are famous for handling contract staff, but we always
have a large selection of full-time vacancies.
Phone write or call in and chat to Elaine Collis or Sally Oliver
anytime.

Knight



New Release GEORGE III OP 1 YR. CONTRACT
Earn £120 per week plus a bonus. Ring June,
Jane or Sue for further details.

New Release IBM 360/370 DOS/VS CONTRACT
Do you have the POWER to GRASP a contract?
Several jobs in Essex, Kent and Midts.

New Release PDP 11 URGENT
This is a TOP SECRET assignment, so when you
call please ask for UNCLE... schhh...

New Release ICL GEORGE II — SHIFT LEADER CONTRACT
6 month contract (or sentence) located in the scenic
delights of North London. Call us now.

Top Op. OS JCL WRITERS
PARLEZ VOUS FRANCAIS?
Vous parlez un peu? Très bon. If you
think you could read and understand
data control manuals written in French,
using a dictionary, contact us now for a
great opportunity.

Data Op DATA PREP JOBS?
Knight is the leading agency for keypunch and VDU ops.
Talk to Shanti or Anita for contract or permanent.

Data Op IBM 370s in EC1 TEMP TO PERM
Interviews getting you down? Try the job on excellent
temp. rates — stay permanently if you like it. Phone Shanti.

Data Op ICL 9905 BDE BALING OR WATFORD
Two permanent vacancies for top VDU ops are paying
£3,700 p.a. — phone Anita for details.

Data Op PUNCH OR VDU OPS EUROPE
Register now if you're interested in working abroad.
Dutch/German language knowledge very useful.

Contract THE COUNTRY IN SPRING ESSEX
Honeywell OS 220 operators 2 shift system.

Contract ICL 9900
Have you acquired good new range experience? Various
opportunities available. UP & B-women VME D VME K
always welcome.

Contract REDUNDANCY CAN HAPPEN TO ANYONE
Experienced operators only. At Knight we will see you
the best contract opportunities.

Contract IBM OS VS1/MTS
A variety of opportunities are available for staff with the
right experience. Call now for details.

Contract DATA CONTROLLERS £185 + per week
Long term contract on a 1900 site.
High rate — conversion to IBM in progress.

Contract OPPORTUNITIES IN EUROPE
We have over 100 operations staff working in Europe
today! Call us now for advice and guidance.

Contract IBM SYSTEM 3, 38, AND 24 OPERATORS
There's work in the pipe line!!

Contract IBM DOS VS POWER VS
Shift Leader level 6 month assignment.
Interested???

Contract JUNE MOGS, SUE SMYTH AND JANE ASHURY
are the operations co-ordinators at Knight.
Just ring or call in.

Contract YOUR FIRST CONTRACT?
We're looking forward to a record summer. So if you've more
than 2 1/2 years operating experience now's the time to come in
to meet June, Sue and Jane and register with Knight. We'll
tell you the pitfalls as well as the advantages.

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WITHOUT VTAM
OR NCP?

No longer
just a
remote
possibility

It's a practical reality now with this unique
PIX REMOTE COMPUTING FACILITY.

For details call Steve Goodwin on
01-890 1477 Ext 35 or send advertisement,
name and company letterhead to
Data Communications Division,
EMI Technology, SE Labs (EMI) Ltd.,
Spur Road, Feltham, Middlesex.

EMI Technology
PIX

MYRIAD

MANAGER FOR PRE & POST SALES SUPPORT TEAM

£9,000 +

A Manager or Systems Consultant with experience of small computer installations such as ICL 2903, IBM System 3, or Burroughs B1700, is required to lead a team of systems and programming professionals functioning in a pre and post sales support role. The Company is able to offer unlimited scope in the small machine area and a progressive career path to managers currently restricted by the size of their installation, or the extent of their current activities. The position entails client interaction, project management and the technical and personnel development of the support team. Based in the City the successful applicant is unlikely to have less than five years' D.P. experience, and will have functioned in both a systems and programming role. The environment is exceptionally professional with project teams working to the highest standards. Conditions of employment are commensurate with a major operation, including relocation assistance where necessary.

Ref: A2/1503

DEVELOP SOFTWARE FOR COMMUNICATIONS SYSTEMS

BERKSHIRE TO £7,000

With the ever increasing emphasis being placed upon distributed processing and remote computing facilities, data communications is now one of the fastest developing and most important spheres within the computer industry. Already established as a major force within the industry and an international leader in the field of data communications the company is now commencing development of the next generation of communications equipment. This will provide a "total solution" to communications requirements, and will make extensive use of mini- and micro-based software products. At present we are seeking two programmers to join this new and enthusiastic team and work on sophisticated communications software. A background in programming the PDP11 is sought, and experience of RSX11M is particularly relevant.

Excellent conditions of employment include twenty-four days holiday and generous relocation assistance, if required. These positions offer outstanding opportunities to work in one of the most demanding, and therefore most in demand, areas of data processing.

Ref: SW1/1503

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981

MANAGERS FOR SYSTEMS SUPPORT TEAMS

£7,500-£9,500

There are several outstanding vacancies at various levels for Systems Managers or Consultants, with experience of medium ICL 1900/2900 mainframe applications, now seeking a demanding role and positive career advancement to more senior levels of management. Initially leading teams of analysts and programmers the new managers will be responsible for a wide range of projects and development of applications for a variety of installations primarily in the City of London.

Successful applicants will be unlikely to have less than five years' commercial systems experience, together with a sound awareness of business issues.

The Company offers excellent conditions of employment with a starting salary and benefits making a package in the range of £7,500 to £9,500. Career progression, working environment and conditions of employment are excellent, with relocation assistance available where necessary.

Ref: A1/1503

MANAGER MINI & MICRO PROJECTS BERKSHIRE CIRCA £8,000

The power and versatility of today's mini-computers and micro-processors, coupled with the development of sophisticated and reliable data communications is opening up exciting and unusual new applications areas within the data processing industry. One of the most interesting of these applications is the use of the computer as an intelligent tool in the management of data networks, and at present a Project Manager is required to lead a team initially working on the development of just such a product.

State-of-the-art software development is a very demanding role. The person appointed will need the ability to guide a team in the development of entirely new techniques, and should be able to offer a sound mini and/or micro background incorporating experience of RSX11M, and communications protocols.

In addition to a good commencing salary, a range of fringe benefits including 24 days holiday and a comprehensive relocation package is offered. As a major force in a rapidly expanding sector of the computer industry, the company provides a rewarding career at the forefront of computer technology.

Ref: SW2/1503

MYRIAD

PROGRAMMERS PROGRESS TO ANALYSIS

N.W. LONDON

£5,000-£7,000

An excellent opportunity has arisen for programmers wishing to progress their careers within the systems development division of a major international organisation. Our client is looking for persons with good commercial experience (preferably gained at an IBM installation) who possess the personality and initiative to become effective systems analysts. Formal training will be given to the successful applicants who will join system teams to develop and subsequently implement a variety of applications, some of which form part of complex, multinational projects. Additionally, the systems analysts will be responsible for pro-

ducing business proposals, preparing cost and benefits appraisals, estimating project requirements and maintaining installation standards. The more senior persons will lead a team of analysts, reporting on progress whilst controlling the quality of work produced.

The company, based in modern offices on the outskirts of London, offers impressive starting salaries and very attractive career prospects. Employee benefits include generous relocation expenses, pension/life assurance scheme and a staff restaurant.

Ref: S1/1503

PROGRAMMERS FOR OPERATING SYSTEMS & COMMUNICATIONS

Near HAMMERSMITH

DUAL ICL 2960

Our Client has now completed the installation of a dual ICL 3mb 2960 configuration initially running under both DME and VME/B with two communications processors controlling a TP network linking regional offices throughout the UK.

Two excellent opportunities now exist for Programmers with a minimum of one year's commercial programming experience who wish to gain valuable expertise within the extremely rewarding area of Software and systems programming.

TRAINEE VME/B TECHNICIAN

£4,000-£5,000

The Trainee VME/B Technician will receive comprehensive training in 2900 Operating Systems in order to provide the most efficient and reliable service to users. Monitoring the performance of VME/B and Applications Systems, the successful candidate will assist in tuning the system and play an active role in the introduction of new facilities. This vacancy provides an outstanding opening for a Programmer with approximately one year's commercial experience to be trained in VME/B and embark upon a career in systems programming.

The Company is a major British organisation with diverse interests in industry and offers excellent conditions of employment and a progressive career within DP.

VME/B CONSULTANT £6,000-£7,000

This is an ideal position for a person with around eighteen months experience of VME/B to become a Senior member of the technical support area within the installation and also gain extensive experience in the company's communications network. Responsible for a small team of technicians the person appointed will supervise the operating system and TP network linking regional offices. Candidates should have at least four years' DP experience and be keen to pursue a career in technical programming. Communications experience would be an advantage but is not essential since full training will be provided.

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981

Handwritten signature/initials

SYSTEMS ANALYSTS AND PROGRAMMERS BEDFORDSHIRE

Major database applications

We have been retained to recruit additional systems analysts and programmers by a progressive and well-known organisation based in Bedfordshire.

The data processing department is well established and fulfils a central role in providing essential control systems and management information covering all aspects of the

company's operations. The installation is a medium-sized IBM 370 and DL 1 and CICS VS are already in use in key areas of the company.

Major new projects are to be developed making extensive use of database and involving additional teleprocessing including links to remote locations.

Applications are invited for the following positions:-

SYSTEMS ANALYSTS c £7000

Candidates should have 3 to 4 years experience in systems development work. A background in programming would be useful but is not essential. (CW 79013)

PROGRAMMERS c £6000

These positions should appeal to ambitious young programmers who should have about 3 years COBOL experience. Previous IBM experience is not necessary. (CW 79014)

Previous database experience is not essential. Our client will give you invaluable training and practical experience in this key area of systems development.

Working conditions and staff benefits are first class and salaries offered will reflect the qualifications, experience and potential of the successful candidates. Generous relocation expenses will be reimbursed in appropriate cases.

Contact Ivor Norton by telephone or in writing quoting the appropriate reference at your nearest office. Interviews will be arranged at locations throughout the U.K. to suit the convenience of suitable applicants.

Ivor Norton Management Services Ltd

Recruitment Consulting Division

52 Shaftesbury Avenue, London W1V 7DE. 01 734 8862 (24 hour answering service) P.O. Box 63, Copthall Town House, Harrogate HG1 1TS. Tel: Harrogate 66628

JBA

Systems Analysts (Defence Project)

Munich c.£19,000 net/yr.
Our client, seeks experienced Analysts who have been engaged on defence projects for a number of years, preferably involving machines such as the Hughes 5118 and 1116 mini-computers. An in-depth knowledge of COBOL is essential.
The project work will be connected with an avionics air-to-air guided weapon system and a low-level radar detection system intended for a major ground force in Europe.
Long term assignment, first class salary and great opportunity to enjoy a high living standard.
Contact: Mike Crenner

Analyst Programmer

Paris c.£10,000+
A well established banking and commercial trading company has a vacancy for an Analyst/Programmer to join a development group in Paris who are responsible for commercial systems.
Applicants must have a minimum of two years as an Analyst/Programmer working on accounting applications. Experience of minicomputers and on-line systems is essential, particularly the HP3000 equipment. Knowledge of French is desirable but not essential as assistance is available for language training.
Excellent salary and fringe benefits for this opportunity to live and work in Paris.
Contact: Jim Baker

Designers - Industrial Systems

Bracknell up to £7,500
Our client, a small software group in a well established British organisation, have opportunities for Systems Designers to take responsibility for the development of real-time applications.
Candidates must have a programming background (e.g. ASSEMBLER, CORAL, RTL/2) and several years in the design of special systems using minis or micros. Project leader experience would be an advantage.
This is an excellent opportunity to work on advanced applications in a small professional environment but with large company benefits which include new offices, relocation assistance, free car parks, etc.
Contact: Jim Baker

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W1. Tel: 01-491 4478

Technical Authors (Software)

Paris c.£12,000
Long term contractual positions are available to Technical Authors or documentation oriented Programmers who wish to enjoy living and working in one of the most exciting capitals of Europe.
The work covers a variety of aspects from user guides to detailed descriptions of software application products and operating systems. Knowledge of communications and/or distributed processing systems is particularly desirable.
Contact: Mike Crenner

Systems Consultants

Newman Street, London W1 (based) range £8,000 - £10,000 + LOGICA continue to expand their presence in the commercial systems market (as part of a very diverse £10 mill. business) and is extremely well known for the high level of expertise in problem solving.
Opportunities now exist for additional consultants who can show a solid all-round d.p. background encompassing both programming and commercial systems experience. Knowledge of COBOL or PL/I and on-line techniques plus involvement with retail/distribution/minor order applications would be of particular interest.
Hardware background is unimportant - although IBM, or HONEYWELL, is particularly useful. Versatility, flexibility and in-depth d.p. knowledge are the key factors we shall be seeking.
Contact: Margaret Stevens

(Micro) Compiler Development

N.W. London £5,000 - £6,500
This small and highly successful systems house is commencing development of a new compiler, designed exclusively for use on micro-computers in a real-time, on-line environment. The project has room for a junior programmer with 18-24 months mini or micro Assembler programming experience, and who has the personality to be able to liaise with clients and customers.
The appointee will be joining a team of outstanding talent, which is breaking new ground in the world of micro-based business systems and operating software design and which has forged an almost unique place for itself in the software market. An unparalleled career building opportunity.
Initial salary will be negotiated according to experience.
Contact: Andy Wright

TEESSIDE POLYTECHNIC Computer Centre

The Computer Centre provides a computing service for the teaching, research and administrative work of the whole Polytechnic. It is equipped with a powerful Univac 1110 machine recently installed which will support over 60 terminals and an extensive range of graphics devices.

A number of additional posts have recently been established. Applicants are now invited for the following posts which offer an opportunity to join a growing team engaged on a number of interesting developments.

Projects Manager

(Information and User Support) - New Post
£6000-£7000 (including supplements)

To lead a team of Programmers/Analysts charged with ensuring that good technical support is given to staff and students using the computing facilities provided. The team is responsible in particular for all technical documents and user guides, for courses of instruction on the facilities for the programming advisory service and for general liaison with the user community. Good experience of computer applications and a ready interest in helping others is essential. Some knowledge of the techniques of technical writing or of teaching would be an additional recommendation.

Projects Manager

(Applications Programming) - New Post
£6000-£7000 (including supplements)

To head a team of Programmers/Analysts responsible for providing and maintaining a wide range of applications software, including statistical and numerical packages and engineering and database software, offering specialist advice on its use and supporting library and administrative computing. Broad experience of computer applications including technical computation is essential.

Candidates for the posts should possess a degree or similar level qualification in a suitable subject.

Application forms and further particulars from The Registrar, Teesside Polytechnic, Borough Road, Middlesbrough, Cleveland, to whom they should be returned within 14 days.

SOUTH DERBYSHIRE DISTRICT COUNCIL

Do you have at least 2 years' COBOL experience and feel your talents could be better employed by a move into systems analysis? If so, you may be the person we are looking for as:

PROGRAMMER/ANALYST

£3,732-£4,632

The Council is awaiting delivery of the very latest Honeywell Level 62 technology with 320K memory and 3 x 80 mb discs to replace its present 61/60. The successful applicant will be a member of a team engaged initially on conversion to the new installation and thereafter will play an important role in developing new systems.

The Council's offices, which by early summer, will be situated in a new purpose built block, are in Swadlowcliffe a small town close to the Midlands motorway network and the cities of Derby, Leicester, Nottingham and Birmingham but within easy reach of such scenic attractions as the Peak District.

In addition to a salary within the above range the Council offers an attractive relocation package. For further details and an application form, telephone Mr. A. G. Meakings on Burton-on-Trent (0283) 221000 or write to The Treasurer, Council Offices, Midland Road, Swadlowcliffe, Burton-on-Trent, DE11 0AH.

Closing date for applications 28th March, 1979.

CMG & BANKING

CONSULTANTS/ANALYSTS/PROGRAMMERS

Due to the past successes and growth of the Banking Services division of the City of London subsidiary of CMG, a new Company has recently been formed specifically to concentrate on the data processing requirements of the Banking world.

We shall shortly be moving to new offices in the City and are looking for further qualified staff to share it with. If you want to join an already established, but relatively small group of DP professionals and can offer a solid DP background together with relevant business experience we would like to talk to you.

We plan and expect a substantial growth rate, thereby rapidly producing opportunities for promotion, so if you are looking for a more responsible position now is the time to act.

Computing Services Association
Member of the Computing Services Association

CMG
London · Manchester · Glasgow
Amsterdam · Rotterdam · Brussels · Frankfurt

In addition to an interesting and varied working environment we can offer:-
* TOP SALARIES
* PROFIT SHARE
* FREE BUPA
* NON-CONTRIBUTORY PENSION & LIFE ASSURANCE
* SHARE PURCHASE SCHEME
* ASSISTANCE WITH RELOCATION EXPENSES
For further details please contact:-
BRIAN HOWLETT (currently at CMG City of London) Limited
53-73 Leaman Street,
LONDON E1 8EY
or phone:- 01 481 3881

Please send me

An Application Form ☐

CMG 1978/79 Report ☐

Name

Address

Tel. Quote Ref: B/1

Programmer/ Analyst

Marlow

Our Computer Services Department plays a vital part in the operation of the Lovell Construction Group. Based in Marlow we operate an ICL 2904 with 3K EOS 30 DDE, VDU and a network of intelligent terminals are being installed for the major contractors operating within the Group.

We now wish to strengthen our small development team and are looking for a person with at least 18 months programming and systems experience in COBOL and ICL 2904 I/O, although training for the latter can be arranged. The successful applicant must be capable of working on their own and preferably have some experience of accounting systems.

The post carries an attractive salary and normal life company benefits apply.

Please apply in writing giving brief career and personal details to:

Personnel Manager,
Lovell Construction Group,
Marham House,
Station Road,
Gerrards Cross,
Bucks. SL9 6ER.

Lovell

THE POLYTECHNIC, HUDDERSFIELD

DEPARTMENT OF COMPUTER STUDIES AND MATHEMATICS

SENIOR LECTURER or LECTURER (Two Posts)

Ref: ACA/274

Applications are invited for the above posts which are to support and develop the work of the Department in Computing. The successful applicant will be responsible for the delivery of the Department's courses and will also be responsible for the recruitment and development of staff.

1. Information systems and systems design
2. applications programming
3. design and implementation of data bases

A good honours degree and/or MSc is essential.

Staff will be expected to undertake activities including teaching, supervision of students, research and consultancy.

Salary: L1 £4101-£4888 (Scale 1978-79)
L2 £4889-£5777 (Scale 1978-79)

Further details and application forms will be available from the Department of Computer Studies and Mathematics, The Polytechnic, Huddersfield, HD1 3DH. Telephone: 0484 223333. Fax: 0484 223333.

PROGRAMMER TEST TECHNICIAN

Pretend the countryside? Then make your move with us to our new premises near Croydon - close to the M23. Being a small, rapidly expanding company, you have the chance of growing with us and creating your own opportunities for progress. You will be working on varied and unusual microprocessor applications in a pleasant, informal and creative atmosphere. You might even enjoy it!

01-491 3010
ELAN DIGITAL
SYSTEMS LTD.

UNIVERSITY OF KENT AT CANTERBURY

Graduate Demonstrator in Computer Science

The post (available from 1 October, 1979) involves looking after a UNIX system running on a PDP-11 and used for teaching. Duties will include maintaining UNIX, responding and enforcing the system for teaching needs, helping students with programming, and supervising projects.

Candidates should have a good honours degree in Computer Science and a lively interest in systems programming. An existing knowledge of the C programming language would be an added advantage.

The current salary scale (under review) is £384-£604

Applications forms and further particulars may be obtained from H. S. Clayton, Senior Assistant Lecturer, The Registry, The CT2 7NE, Canterbury, Kent. Tel: 01843 231 2631. Quoting reference A10/78. The closing date is 15 April, 1979.



We see a rosy future in Walton on Thames and Croydon

Systems Analysts and PL/I Programmers

The progressive environment of our DP Centre offers challenge and responsibility and will provide plenty of opportunities to those wishing to realise their full potential. Systems Analysts will be based at Walton on Thames, or at our head office in central Croydon, and should have around 2 years' relevant experience. Programmers, with at least 18 months' commercial IBM experience, will be based at Walton on Thames and will be retrained if necessary.

Competitive salaries, according to experience, are backed up by the benefits normally associated with a major company, including relocation assistance where appropriate.

We'd like to tell you more about that rosy future. Meet us for a drink and an informal chat on Monday 19th March and Tuesday 20th March between 12 noon and 8 p.m. in the Curzon Suite at the May Fair Hotel, Berkeley Street, London W1 (one minute's walk from Green Park Tube station).

If you can't make these dates, phone Vivian Fairhurst, Personnel Manager, on 01-686 8899. Or write to her at Brooke Bond Oxo Ltd., Leath House, High Street, Croydon, Surrey CR9 1JQ.

Brooke Bond Oxo Limited

Handwritten signature: John Smith

JBA

Advanced Data Comms/Message Switch Systems Development

SCICON is a highly successful member company of the BP Group, with a growing international reputation for excellence in developing advanced systems and software. The Communications and Control Systems Division requires a number of high-calibre technical staff to augment their team in order to undertake an increasing volume of new orders and software development projects.

The division has access to a wide range of in-house mini/micro computers, including PDP11, NOVA 3, HP 1000, microNOVA, Intel, and Zilog. The computer room and micro-development workshop offer scope for those who relish a hands-on environment. Professional staff are required in the following categories:-

Technical Consultants salaries c. £9,000

Candidates must be able to show extensive involvement with either Data Communications or Message Switching software and applications. They should be keen to progress either in Project Management or in a Technical Sales/Sales Support role.

Analyst Programmers salaries to £7,000

To join communications software development teams, candidates should have 2-3 years mini-computer Assembler experience. Ideally they will have been involved in writing basic software, i.e. drivers, protocol handlers, etc.

SCICON offer an interesting, challenging career in an environment where initiative and commitment are encouraged and rewarded.

For further information on the above vacancies please contact: Margaret Stevens.

JAMES BAKER ASSOCIATES
International Personnel Consultants.
16 Maddox Street, London W1.
Tel: 01-491 4478.

Data Base

Up to £10K

A top-bracket British International software house is starting work on new Data Base projects. Although, obviously, this calls for people with big Mainframe backgrounds, previously successful associations have brought this Client back to Real Time Mini's Place for help in finding:

Project Leaders to £10,000

You have to be applications orientated, with 5 to 7 years' large installation experience, including solid Data Base techniques. COBOL is essential.

Systems Programmers to £8,000

Software orientated, with 2 to 5 years' experience, using a low level language.

Whichever you are, Project Leader or Systems Programmer, you must be prepared to travel within the U.K. and, later, probably, overseas.

The perks are excellent. Pension, life assurance, house purchase and season ticket loan schemes are all part of the package.

To apply, simply dial 01-836 9719 or 8982 and ask for Beryl McLaren.

Jupiter Computer Appointments
(Real Time Mini's Place)
Suite 43, 12-13 Henrietta Street,
London WC2

Computer Services Manager c. £7,000

G. A. Harvey Office Furniture Ltd. is part of the Hunterfield-Harvey Group and has recently consolidated its production facilities and office on the outskirts of Margate. The opportunity has been taken to revise its bureau based computer processing and RJE terminals will shortly be installed. There is an ambitious program to extend the use of computer processing for order entry, production and stock control and management information. In time, an in-house computer will be installed.

A manager, reporting to the Finance Director, is required to control the bureau operation and associated office procedures, and to assist the Company in its development of computer based systems. The position will appeal to someone who has played a major role in implementing a successful computer application including involvement in clerical support systems, and who now wants to manage and develop a computer unit. This is a key position with great scope and applicants, male or female, must be able to demonstrate management potential over and above mere technical competence.

The salary is negotiable and relocation expenses will be paid if the manager wishes to move to this attractive part of Kent which is close to several resorts and with good connections to London.

Please send adequate particulars, in confidence, to P. R. Billinghurst of:-

Spicer and Pegler
Management Consultants,
3 Bevis Marks,
London EC3A 7HL.

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As specialist agents in the Engineering, Scientific and Technical industry we now deal with over 4,000 companies throughout the U.K. There is an urgent demand from these companies for qualified and motivated programmers with FORTAN experience. Jobs from £3,500 to £8,000 a year. Please us now for a free list of vacancies.

Capital Appointments, 28 Windmill Street, London, W1
Telephone: 01-637 8881 (day) — 01-636 9696 (even).



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PART 3 OF 4

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Opportunity to retrain on other manufacturers' hardware. A base in Cheshire — yet still meet a lot of clients. Excellent training, working conditions and prospects. Development work coupled with responsibility. Profit sharing and a good pension scheme.

DO YOU HAVE?

At least 6 months' practical programming experience. Knowledge of Cobol on any machine. The ability to work for a software house.

OUR CLIENT WILL PAY

JUNIOR PROGRAMMERS £3855-£4475, PROGRAMMERS £4000-£5197
PROGRAMMER/ANALYSTS £4788-£6136, SENIOR PROGRAMMERS
£5242-£6743

IMMEDIATE INTERVIEWS ARRANGED

by contacting Dave Hedley at the above address or phone number

TO BE CONTINUED IN 2 WEEKS

Forestry Commission, Research Division, Alice Holt Lodge, Farnham

Mathematician/Computer Scientist

This post is in the Statistics and Computing Branch which provides full support to the research programme of the Division. Current projects include silviculture and silviculture studies and forest management and protection schemes. As a member of a team, the computer programmer appointed will undertake statistical data analysis, develop and document the Commission's computer data-base, implement models of current problems and manage supporting information files. The work will involve close liaison with statisticians and project leaders and programming in FORTRAN.

The computing facilities include an in-house IBM 1130 with 8-k store and exchangeable disk access through the IBM 1130 and a variety of VDU terminals to a bureau UNIVAC 1100 and an IBM 360/195. A new in-house computer is expected within the next year. Candidates, normally aged under 27, should have a Degree or equivalent in mathematics or computer science and a knowledge of statistical methods. Some programming experience is highly desirable. Appointment as Scientific Officer £4,220 p.a. with starting salary according to qualifications and experience. Promotion prospects, non-contributory pension scheme. For further details and an application form please return by 29 March 1979 to Mr J. J. Freeman, Personnel Branch, Forestry Commission, 231 Corstorphine Road, Edinburgh EH12 7AT. Please quote reference: SLD/DM.

DE HAVILLAND COLLEGE The Campus Welwyn Garden City, Herts DEPARTMENT OF COMPUTER STUDIES LECTURER GRADE II

Required from 1st September, 1979 to 1st October 1980. The successful candidate will be responsible for teaching and supervising students in the Department of Computer Studies, Welwyn Garden City. The post involves a combination of teaching and research.

Applicants should have a degree in Computer Science or a related subject and should have at least 3 years' experience in teaching and supervising students. They should also have a good knowledge of the principles of computer science and be able to teach and supervise students in the Department of Computer Studies, Welwyn Garden City. For further details and an application form please return by 29 March 1979 to Mr J. J. Freeman, Personnel Branch, Forestry Commission, 231 Corstorphine Road, Edinburgh EH12 7AT. Please quote reference: SLD/DM.



SCIENCE RESEARCH COUNCIL

COMPUTER PROGRAMMERS FOR SPACE RESEARCH

APPLETON LABORATORY has vacancies for COMPUTER PROGRAMMERS to work on data processing and control in support of a major International Satellite project, the Intre Red Astronomy Satellite (IRAS), which will be launched in February 1981. The Science Research Council has the responsibility for providing the satellite control centre and a scientific data analysis centre for this project which is a collaborative venture with the United States and The Netherlands. The main computers that will be used are two PDP 11/35 machines and a large ICL mainframe. Programmers are needed in the following areas:

real-time software
large-scale data base handling
orbit and attitude analysis
scientific data processing

Posts will be available at both Scientific Officer and Higher Scientific Officer level. Applicants should have a degree, HND, HNC or equivalent qualification in Science, Mathematics or Computer Science, with at least two years' programming experience for the higher posts. The posts will initially be located at Ditton Park, Slough, but will probably be transferred later to Chilton, Oxfordshire.

Salary will be on the following scales (Outer London Weighting Allowance included), the exact step depending on qualifications and experience: £4378-£5723 for an HSO or £3114-£4890 for an SO.

Non-contributory pension scheme.

Please request an application form from:

The Secretary
Science Research Council
Appleton Laboratory
Ditton Park, Slough SL3 0JX
Tel: SLOUGH 44234, Ext. 153.

Closing date: 5 April, 1979

RGP II PROGRAMMER

Applications are invited from Programmers with a minimum of 18 months' experience of RGP II (preferably ICL).

The successful candidate should be in their early 20's and be able to work with minimum supervision.

Salary will depend upon experience and qualifications.

For an application form apply to:

The Company Secretary
Johnston Administration Limited
Johnston House, Hatchlands Road
Redhill, Surrey RH4 1BG

HAMPSHIRE EASTLEIGH COLLEGE OF FURTHER EDUCATION Chesnut Avenue Eastleigh SO6 5HT LECTURER GRADE I in COMPUTER STUDIES

wanted from
September 1, 1979.

Salary

£3,182-£5,324 p.a.

Further particulars and

application forms available

from the Principal (Tel

814424).

JBA

Software Manager

Birmingham c. £11,000 plus car

We have been retained by a large international engineering group to recruit a Manager. The company have decided to centralise all of its European computer facilities to Birmingham and require an experienced Software Manager to set up the correct technical environment to run this new utility. The installation will operate under MVS with TSO and will offer IMS facilities to its users.

The position reports to the Director of the Centre and will be responsible for approximately twelve technical staff.

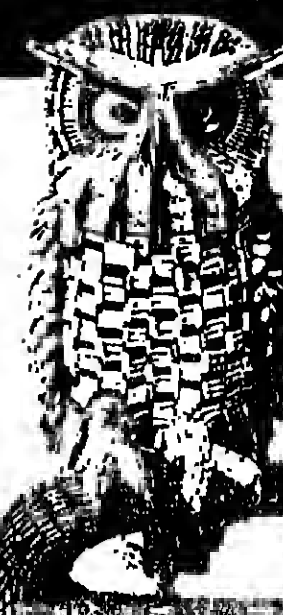
The job demands a person with excellent man management skills, a high degree of technical expertise and the potential for advancement to senior management.

This is an above average opportunity, with a salary negotiable according to experience and large company benefits including relocation assistance and BUPA.

For an informal discussion, please contact Jim Baker.

JAMES BAKER ASSOCIATES
International Personnel Consultants
16 Maddox Street, London W1.
Tel: 01-491 4478.

COMPUTER EDUCATION



Honeywell is a world leader in computer design and manufacture. Our success story is based on superb technology and aggressive marketing backed by probably the best training in the industry. As part of a continuing programme, we are seeking top quality Lecturers and potential Lecturers with suitable experience to join the staff at our Education Centre in Hammersmith, West London.

Covering a wide range of subjects, our training staff fall into two main categories.

Programming and Systems - which would suit people with a practical D.P. background as Analysts, Programmers or D.P. Managers, who are keen to broaden, develop and pass on their know-how to others.

Management Services - those who have worked closely with

computers in a Management Services environment, possibly in D and M, and preferably with some knowledge of finance or accountancy.

We provide training for our own staff, and for our clients, both in the UK and overseas. Our Lecturers are involved from course design, through implementation to evaluation in an organisation which believes that good training makes good business sense and can prove it.

Of course, we train our Lecturers, building on their existing knowledge and skills with a tailored programme of induction into our products and teaching methods.

These vacancies, which are open to both men and women, offer an excellent opportunity to enter an extensive and sophisticated training environment, where specialists!

Lecturers are continually having their knowledge updated, giving the ideal platform for subsequent progression in an exciting and fast growing company.

And, as you would expect, our salaries and benefits are geared to attracting the calibre of applicant we are seeking.

Please telephone or write for an application form to Nick Phillips, Director of Education, Kings House, 174 Hammersmith Road, London W6 Tel: 01-748 4191.

Honeywell

Share your knowledge with us and our customers and we'll teach you a thing or two - about success!

Recruitment



In Informatics

Software Development Experts Netherlands

Salaries to: £15,000

If you wish to relocate immediately to a permanent based career position in the Netherlands then read on... You must offer considerable expertise in two or more of the areas outlined below. Call us immediately because our client is conducting a series of interviews on our premises during the month of April. The required areas of expertise are: (a) Quality assurance, (b) Advising of development departments on usability, (c) Pre-sales support, (d) Problem solving, (e) Release preparation.

(f) Evaluation of new products. In addition to above average salaries our client will pay full relocation expense, assist in obtaining permanent housing (which in the case of this company is more readily available than is usual in the West Netherlands) and will meet the cost of Dutch language courses for the employee and his partner. Of course, pension plan and health insurance are an integral part of the package. There are real opportunities for transfer worldwide throughout the company's organisation.

Multi-National Banking Corporation City of London

Salaries: £6K - £9K

A prestige Banking Corporation with extensive computing facilities in the City of London, Germany, Switzerland and Italy requires additional Data Processing personnel up to Team Leader level for both its Mini and Mainframe divisions. The Mini Division essentially requires COBOL Programmers and Systems Analysts preferably from a financially orientated background. The mainframe Division has a need for PL/I Applications Programmers who offer a second programming level either IBM BAL or

COBOL. The ability to work as a member of a project team under strict documentation and structured programming standards is vital. An important additional benefit for the more senior positions will be the travel prospects. Candidates can expect monthly travel to one or more of the Bank's other European Data Centres where new hardware and associated software is to be installed very shortly. Initial interviews will be conducted in the City within three weeks of the appearance of this advertisement.

Systems Engineers Belgium

Salaries up to £15K

An internationally renowned supplier of Data Base and Teleprocessing Management Systems has requested Logistix to identify top calibre D.B. or T.P. Systems Engineers. Technically speaking you must have current experience in the implementation and support of Data Base and/or Real-Time systems. Suitable applicants should offer IMS DB/DC exposure although due consideration will be given to those having extensive knowledge of an independent suppliers' software. You could presently be engaged in the areas of budgeting/forecasting, foreign exchange/investment or the presentation of products to both English and French

speaking executives within a seminar environment. Consequently whilst fluency in French is not a prerequisite (since language courses can be provided at the company's expense) a certain knowledge of the language is desirable. The higher than average salaries (even for Belgium) reflect the prominence which our client places in the acquisition of these key personnel. Excellent benefits include full relocation expenses, life and disability insurance, pension/medical plans and a housing allowance. We will conduct first interviews after which candidates will spend a day with the company before offers are made.

Graduate Commercial Programmers Central London

Salaries to £6K

We wish to hear from COBOL or PL/I Programmers who may perhaps have joined their present company on leaving University or Polytechnic in the summers of 1976 or 1977 and who now wish to expand their programming techniques — perhaps Structured Programming or Michael Jackson's standards. Well, if that's the case then our client wants to make you a very tempting but realistic offer. Whether you have worked on IBM, ICL or Honeywell mainframes or DEC, Hewlett Packard or Data General minis, you will be given ample opportunity to further your skills either as a member

of an in-house project team or working solely or jointly with the personnel of the company's clients. Those who wish to convert their mainframe experience to mini involvement can be catered for quite easily since the company is only too happy to provide full training through the use of seminars and residential courses. TO APPLY: Contact any of our Recruitment Executives who will make arrangements to meet you or alternatively for those living outside London local arrangements can be made. If you cannot make telephone contact then please forward your up-to-date resume.

Senior/Junior Software Designers Home Counties North

Salaries: £6K - £8K

A Micro-Computer Division within one of the U.K.'s largest indigenous organisations is seeking several Software Designers for its home based operations. The successful candidates will be assigned to the Applications Team, where they will conduct all the integral stages in the detailed design of new software modules; test the code procedures and integrate with existing modules. Candidates must offer a

minimum of two years Assembler Language experience although specific mini computer or micro-processor involvement is less important. Generally, candidates should have worked in a small Project Team environment within a Software/Systems House or Manufacturer. Interviews will be held on an on-going basis throughout the latter part of March and the whole of April.

Logistix, Freepost 32, London W1E 3YZ

360 Oxford St.
London W1N 9HALicensed by D.O.E.
Licence No. SE (A)2887

01-491 4636



Telex: 29800

Numerate Engineers Analysts Programmers

The System Problem Analysis Group of Ferranti Computer Systems Limited is an expanding organisation that undertakes analytical and scientific programming tasks for external agencies (in the UK and Europe) and in support of Ferranti's Real-Time System Projects:

Our Work Includes:

- * Signal Processing — Sonar and Radar
- * Target Tracking — Active and Passive
- * Fire Control Systems — Gun and Missile
- * Computer Simulation — Event and Time Based
- * Scientific Data Processing and Mathematical Analysis
- * Control Systems — Continuous and sampled
- * Microprocessor Systems — Design and implementation

We require new and experienced graduates in a numerate discipline to take part in our future expansion. Successful applicants will be capable of:

- * making significant contributions in new fields
- * communicating effectively
- * liaison with customers

We can offer:

- * high job interest
- * flexible working hours
- * competitive salaries
- * paid overtime and bonus scheme
- * early opportunities for responsibility
- * friendly, informal atmosphere

If you feel you can meet the challenge that our kind of work offers, then please ring our Recruitment Officer on Bracknell 3232, ext. 471, or write quoting ref. no. D/884/CW to:—

The Personnel Officer, Ferranti Computer Systems Limited,
Western Road, Bracknell, Berkshire.

These posts are open to male and female applicants.

FERRANTI
Computer Systems

Saudi Arabia

Norconsult, a leading Norwegian firm of consulting engineers, are responsible for the planning and supervision of Saudi Arabia's telephone expansion programme. In Riyadh, the company has, for both technical and administrative applications, an HP 3000 computer with 512K memory, 10 terminals plus 4 graphical terminals and a calcomp plotter type 960 for A1 drawings (with digitaliser). Program languages are FORTRAN and COBOL. KSAM file and image data systems are used. There are terminals in Dammam and Jeddah.

The company requires:

One Systems Programmer
aged 28 - 35, c. £11,500 tax free, ref. FY.1034-77

One Operator Technician
aged 24 - 30, c. £9,000 tax free, ref. FY.1034-78

Candidates should have some 5 years' relevant experience, whilst previous Middle East experience would be an advantage.

One year single status contracts include free accommodation, 2 weeks' leave every 3½ months with air fares paid to and from the UK.

Please write with brief career details — in confidence — to A. R. Duncan, quoting the appropriate reference.

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London & Southern

Analysts

MGT Systems — Acton — Urgent
Honeywell TDS/IDS North London
IBM TSO, IMS Herts
IBM & ICL Various

6 months
3-6 months
1 year
6-12 months

Programmers

Honeywell Cobol — Over 30 vacancies
Honeywell IDS Cobol N. London
Honeywell IDS/TDS Surrey
PDP Fortran — Bucks.
MUMPS — Berks & Holland
ICL Plan/Cobol N. London
Honeywell TDS Maintenance Paddington
DEC — Numerous — H. Counties

6-12 months
6 months
1 Year
6 months
6 months
12 months
6 months

And Many NEW Requirements Weekly — Register Today All Machines.

Overseas

MUMPS — Holland
CICS A/Prog. — Kuwait — Urgent
IBM Cobol French or Portuguese Speaking — for Portugal
IBM Software Progs. — Kuwait
IBM PL/1 Progs — Holland
IBM IMS or DL/1 — Holland

6 months/ 12 months

Midlands

Honeywell IOS Cobol Analysts & Progs
Honeywell L6 Cobol — Urgent
IBM Fortran Progs — Staffs
Univac Cobol Progs — Derbys.
Cobol — IMS — DL/1 — Leics.
ICL 1900 & New Range — Staffs.

1-2 years
6 months
5 months

Northern

Honeywell TDS/IDS — Lancs.
Honeywell IDS Analysts — Northumbria & Teesside
L66 CICS Progs. — Hull
IBM CICS & DL/1 Doncaster
IDS Cobol Analysts & Progs. Liverpool
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IBM/ICL Cobol Progs. — Lancs.
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southern electricity

SYSTEMS PROGRAMMER

SALARY £4,200-£6,200

(Currently under review)

Southern Electricity are currently engaged on the development of an ambitious Engineering Computing System comprising two ICL 2950's, two PDP 11/34's and distributed control and information microprocessors. The main operating systems will be VME/K, George 2 plus, and RSX 11 M.

In order to achieve our development plans we are now looking for an ambitious young programmer to join the systems team who are responsible for looking after the various operating systems. Ideally the candidate should have a good programming background and some knowledge of JCL or SCL although all necessary training will be given. The candidate should also be educated to at least HNC level in a suitable subject and exhibit a lively enthusiasm for learning new techniques.

The post will be based at Littlewick Green near Maidenhead.

The starting salary will be determined according to the successful candidate's qualifications and experience.

Applications on forms obtainable from the Secretary, Southern Electricity, Southern Electricity House, Littlewick Green, Maidenhead SL6 3QB and returned to him quoting 23/79 by not later than April 3, 1979.

Field Engineers required by a major computing company

Storage Technology Corporation is currently one of the most rapidly expanding companies in the line of computer peripherals. As a result we are constantly in need of good, experienced personnel in Field Engineering. We offer competitive salaries, good company benefits, and, above all, superlative advancement potential.

Anyone wishing to become a part of a dynamic field group that places emphasis on training and personnel advancement, should send his employment and salary history to the STC office closest to him.

U.K. Field Engineering Manager — Tom Kenyon 10-12 Old Court Place, Kensington W8. Tel: 01-937 9638.

Benelux Field Manager — Ghan Mosele 47 Boulevard du Souverain, 1160 Bruxelles, Belgium.

France Field Manager — Pierre Plon 5 Allée du Bourbonnais, 78310 Maurepas, France.

German Field Manager — Volkmar Meyer Genfer Strasse 11A, Postfach 550147, D6000 Frankfurt 56, West Germany.

Candidates for Italy should contact J. Skaw — European Field Manager at the U.K. office address.

Candidates for European Technical Support should send applications to Cedric Barnes at the German office address.

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TRIAD

is 6 years old;
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are looking for a career in a growing services company which puts technical achievement first;
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WE

would like especially to hear from you if you can offer relevant current experience in design and development in the following disciplines:

- commercial (mainframes to micros);
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- database;
- automation;
- basic software.

are offering good career structure, salary progression, bonus, share purchase plan, season ticket scheme and opportunity to widen your computing perspective.

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SALARIES £5,000-£8,000+

Write, or ring: Erwin Schneider
TRIAD Computing Systems Limited, 42 Kingsway, London WC2B 6EX. 01-831 7211

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Design and implement new on-line systems including stock control, order entry, production costing and bought ledger. Utilise a lively terminal network on-line to a 1 megabyte ICL 2960. Enjoy beautiful countryside, superb local inns, friendly colleagues and diverse leisure activities.

Apply your analysis skills to numerous application areas from a central site - one of five - in the heart of rural England. Our client is a large, quality engineering company with a number of UK sites and extensive overseas operations. Financial rewards are:

- Relocation to £1,675
 - Gross Salary to £6,900
- £8,575!

Specialise an application area for a new on-line system. Contact us for additional details, interview dates and a fact sheet - by phone or writing direct - and discuss with us what this opportunity will mean for you and your family. Do it now - before you miss the boat!

Phone 01-388 4523 or 01-388 4055 and ask for Jeremy de Bage or Richard Harvey.

J&B Associates
33 Warren Street, London W1P 6SD
Agency Licence RE/A 9838

Systems Engineers Programmers

Advance your professional career in Southern California

Our client, a major American industrial concern with unusually deep capabilities in advanced technology, manufacturing and international marketing, operates one of the largest commercial data networks through a division with headquarters in a most attractive location in Southern California.

This network, widely respected for its technical superiority, features the most advanced equipment and techniques. The teleprocessing system - one of the largest in use in the private sector - is supported by IBM 3033 and Arndahl 470V6 using a broad range of minicomputers for front-end processing.

Rapid growth has created a number of attractive openings for highly qualified professionals in several disciplines including:

- * Application programming
- * Database management systems

- * Communication engineering
- * MVS operating systems
- * Telecommunication networking

Of particular interest are candidates who have extensive experience in developing complex application programmes in large scale on-line IBM environments using ALC, as well as those with broad minicomputer programming in ALC. Candidates should have HNC or B.Sc. qualifications and at least 3 years' directly relevant experience.

London Interviews will be arranged soon. Relocation and immigration assistance will be provided.

Applications will be treated in STRICT CONFIDENCE throughout by us and our Californian associates. Please send full CV with home phone number quoting 1204/CW to Philip Smith:

Philip Smith
Manpower Consultants
85-87 Jermyn Street, London SW1Y 6JD

Over 75%

Of all EMS Candidates receive job offers annually. We have the top U.K. response record! EMS alone are in weekly contact with every U.K. Installation, giving you instant access to top jobs. EMS - unrivalled in ability to propose the ideal career opportunity for you. And over 100 vacancies in the EMS group alone for future expansion!

Systems Analysts / North-West

EMS urgently needs to recruit a large number of two years' plus experienced Analysts to work on a wide variety of commercial systems. Opportunities exist for involvement on real time, database and networking systems, as well as general commercial and merchandising systems. Working for a consultancy involves a variety of site assignments with later involvement supporting Turnkey Systems teams working in your home area. We offer excellent career development prospects with adequate opportunity to either specialise in local region support tasks or the choice of national and inter-national travel is required. Analysts should have at least five years' systems experience in a commercial or industrial environment. Relocation expenses will be paid where appropriate. Candidates should be aged 23 upwards and preferably hold a current driving licence.

Consultant: John Wood. Tel. 0782 823666

Project Managers £6,500

Applications are invited from experienced Project Leaders and Managers interested in joining a rapidly expanding Turnkey group based near Central Birmingham on the Five Ways roundabout. We need professional, computer team Managers, capable of planning, scheduling and implementing modernised application systems configured on mini and micro processors, to an agreed time scale. Ability to design and control the development and final testing of complete systems will be important, as will an adequate programming knowledge for quality checking the work of other team members. Ability to undertake feasibility studies and accurately assess and cost systems and programming requirements to fulfil total client requirements will be an important part of your managerial duties. A wide range of clients are available, covering all sectors of industry and commerce. Car owners will be preferred for this level of appointment as client visits and presentations will be involved. We seek mature, constructive thinkers capable of designing effective application systems and motivating teams assigned to them.

Consultant: Don Philip. Tel. 021-464 7508

Top Turnkey Salesman

Numerous UK Positions - 10-16K Packages + Car

EMS urgently requires experienced computer salesman to help with a deluge of mini computer turnkey enquiries. We currently market two major products, these being the Honeywell Level 5 and the Data General series. We cover the whole of the industrial and commercial sectors, necessitating salesman to have sound marketing experience and being able to present a formal business image in a multi-user environment. Ideally, sales staff will already have a year's mini marketing experience, although a top maintenance salesman now starting to feel the pressures of the mini onslaught on the old, traditional base would equally find that his/her experience would support him/her to attain vast turnover rapidly with EMS product lines and outstanding applications software. We are looking for mini salesman who already have attained sales in excess of £200,000. These people will achieve over £500,000 with EMS leads and support. Mainframe salesman equally can easily double figures marketing entire networks on behalf of EMS. Mature sales presenters capable of achieving top earnings, with no cutbacks are urgently sought by the company to capitalise on the many opportunities already available. Excellent brochures and back-up facilities are available. Good earnings packages and top prospects are available throughout the U.K. Apply now for early interviews.

Consultant: John Wood. Tel. 0782 823666

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We urgently require up to 20 extra experienced programmers to work on a wide variety of Turnkey Systems hardware including Honeywell and Data General systems. Prospects include a wide variety of commercial and industrial systems in addition to working on networks, database and on-line real-time systems. We offer the widest range of career development opportunities with constant project involvement on new technology. You will be continually involved with modular programming working to tight schedules. Customer liaison will also occasionally be involved necessitating a good standard of communication and presentation. Excellent potential exists for motivated personnel. Join a rapidly expanding, fully equipped modern Data Centre with a central staff wishing to visit our Turnkey installations for system implementation.

Consultant: Don Philip. Telephone: 02-464 7508.

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We currently have a wide range of clients urgently seeking capable COBOL, ASSEMBLER and PL/I Programmers with at least one year's Analysis experience to work on a wide variety of applications projects. Our fully computerised job income systems will select dozens of vacancies matching your current experience in the local, national and international markets. We are in weekly contact with every installation throughout the entire U.K. EMS why not follow the path of the professionals. Complete the EMS application form today and see how quickly you can get results for you, you won't be disappointed.

Consultant: Carol Pridmore. Tel. 0782 823666



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With 5 years' computer experience on either ICL, IBM or Honeywell equipment, including 2 years' supervisory experience.

What are we offering?

- Money: Salaries and rates are good and with our expansion programme there is the opportunity to earn more of the time.
- Travel: Our areas of operation in the UK are North of England and Midlands, Scotland, Wales and Ireland, but with more and more of our business coming from overseas there are plenty of opportunities to work in more exotic spots. We currently have contracts in Europe, Africa and the Far East.
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A dynamic man management expert is required to control and coordinate the DP department. Must have 5 years' experience and some knowledge of retail business. CITY.

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£9000 + car
To control teams of Programmers and Systems Analysts engaged in stock control, distribution and group accounting. Candidates must have had programming and systems experience, preferably using Burroughs. CITY.

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£8000
To work on shift maintenance and all enhancements. Must have four years' COBOL experience. Five-week shift rota: two of which are day, one early morning, one late evening and one night. CROYDON.

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To £8000
Five years' BSL programming experience, with a knowledge of DOS/VIS or 380/70 minicomputer installations, is required for this position. Supervisory or Team Management experience is necessary. Responsibilities include the specification and allocation of subordinates' work to achieve targets, and training junior team members. HIGH WYCOMBE.

SENIOR ANALYST

£7500
Senior Analysts required for development work in large consumer product manufacturing company. Must have 5 years' systems experience, from feasibility study to implementation. CROYDON.

SYSTEMS ANALYSTS

To £7000
For information systems and technical records, in DP department where database techniques are employed with information retrieval facilities. Applicants should have at least two years' systems experience, ideal position for future career advancement. C. LONDON.

SYSTEMS ANALYST

£6-£7000
Two years' systems experience required to work on membership projects, feasibility studies, business specifications and systems specifications. Total project control prospects. UXBROOK.

PROGRAMMER

To £6500
Competent COBOL programmer required with at least two years' experience, for 2800 hardware installation. Excellent career development position, with prospects of transferring to System Analyst. Productivity bonus scheme in addition to salary. C. LONDON.

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Professional technical equipment manufacturer requires Analysts with 3 years' DP experience, to deal with product control from feasibility to implementation, specifications, user liaison, etc. Knowledge of programming an advantage. WEST SUSSEX.

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£4000
To work for leading service company specialising in computer systems, fully trained for a Programmer with two or more years' experience of commercial applications, who wishes to move into Analyst. Kent (H. CROYDON).

AMES PERSONNEL
Recruitment Agency Suite 14, 11-12, Old Oak Road, London W10 6AA. Tel: 01-424 1100

PROGRAMMERS WHAT ARE YOU WORTH.....

- ★ a good salary? ★ excellent career prospects?
- ★ training on new hardware/languages, etc...?

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Exciting development plans are under way at this large ICL 280D installation where machines are expected to be upgraded within 6 months. Incentive bonus, £2.50 Lvs weekly and excellent pension scheme. REF. 2101

IBM — MIDDX £5,500

European headquarters of major organisation seeks IBM or ICL COBOL programmers for their IBM 370 hardware to cover a wide range of projects. Have T.P. monitor and utilise database for which TRAINING WILL BE GIVEN. REF. 2157

ICL — CITY to £5,500 + BANK PERKS

18 months' ICL 1900/2800 COBOL experience is all that is required for major British Bank. All NEW development; extremely interesting projects and 2880 due for delivery. Excellent financial package. APPLY NOW! REF. 2094

JUNIOR — ESSEX to £4,800 + MORTGAGE

12 months' IBM COBOL programming experience for financial applications on IBM 370. Co. will consider ANY GOOD commercial programmer at this lower level. RING NOW FOR DETAILS. REF. 2088

PDP II — N. LONDON to £7,500

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ICL — MIDDX to £5,000

Do you want to be trained in ANALYSIS? If so, you need minimum 2 years experience of ICL 1900 or 2800 COBOL experience to be eligible. We look forward to hearing from you. REF. 2070

POP — CITY to £6,500

Major overseas organisation with large network of POP equipment seeks PDP11 Macro II person to work as senior programmer on message switch systems. Device driving exp. asset EXCELLENT promotion prospects. REF. 1834

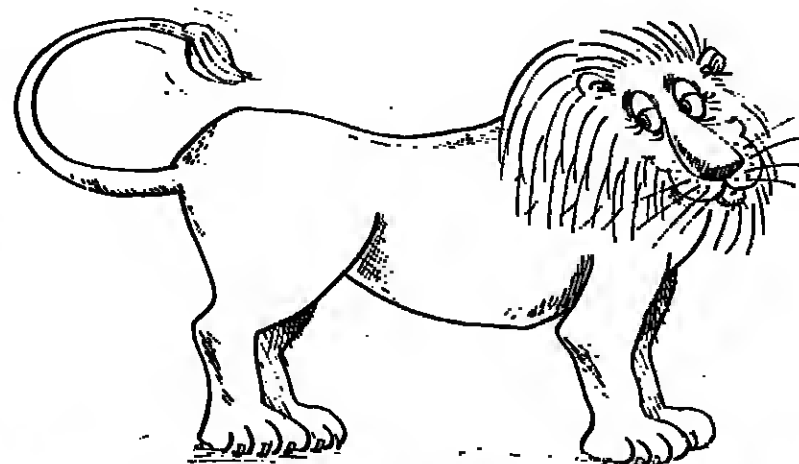
IBM — LONDON to £8,000 + BONUS

Programming Manager is sought for expanding O.P. division. Qualities needed are good exp. IBM software, COBOL & PL/I with CICS, MVS and TSO being a distinct asset. Awaiting delivery of IBM 3031. Will work on own initiative. REF. 2115

IBM — N. LONDON to £6,000

Small D.P. services division based north London seeks COBOL or PL/I programmer to join their friendly team. Company are awaiting delivery of IBM sys 34, thus knowledge of RPG or asset — although training can be given. REF. 2102

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RPGII LONDON to £6,000

International conglomerate is awaiting delivery of large IBM sys 34 equipment and have major development plans for new programmers. What an opportunity for someone with RPGII experience to make an excellent career! Non-contributory pension, £3.25 Lvs weekly, life assurance. REF. 2121

ICL — HERTS to £6,200

Programmer analysts with 3 years' ICL COBOL to become totally involved in all aspects of company's systems and be prepared to contribute to development of dept. Co. has total assets of £2000 m. Exc. fringe benefits. REF. 2148

IBM — KENT Neg. to £6,800

Analysts and programmers who commute when opportunities like this can be found locally. International data centre has large new IBM equipment and seeks persons with min. 12 months' COBOL experience and offers every opportunity for broadening skills particularly in database and T.P. area. REF. 2119

IBM — C. LONDON to £5,800 + Bonus

PL/I PROGRAMMERS STOP HERE! A great chance to become involved in latest IBM hardware! Organisation uses CICS/VB and IMS/DB (experience will be an asset — but training will be given) with a 3031 scheduled for delivery. RING NOW FOR DETAILS. REF. 1840

ICL/IBM — LONDON to £6,000

Major manufacturing and retail group is RAPIDLY expanding and needs additional programmers with ICL 1903/4 AND IBM sys 32/34 equipment. They seek people with 2 years COBOL and/or RPG experience. Training in analysis wherever necessary. REF. 2102

IBM — CITY to £6,000 + MORTGAGE

Senior Programmer is sought for British Bank in the early stages of expansion. 2 years' IBM COBOL and/or ASSEMBLER is expected for this position in 370/138 installation. Excellent banking perks AND 5 weeks' hols. with a good career path in eight! REF. 2143

MINI — LONDON £6,000 + NEG.

International commodity company seeks 2 mini programmers with BASIC & experience to work on major projects, one on accounting system, the other freight forwarding. Small friendly company and excellent career growth potential. REF. 2007

IBM — SURREY to £4,900 + MORTGAGE

Work locally! 3 programmers with around 2 years' COBOL programming experience to work on IBM 370/158 to begin involvement in insurance and accounting systems. Paid overtime, sub. pension and RELOCATION some of many perks. REF. 1888

IBM — N. LONDON £5,500 + MORTGAGE

2 years' RPGII experience to join young and enthusiastic O.P. team. Currently they operate a sys. 3 model 15 with many VOU's on-line. Major enhancements are planned to keep pace with company's rapid growth. Very cheap lunches, non-contrib. pension/life assurance and attractive loans and mortgage schemes. REF. 1959

MINI/ICL — MIDDX to £5,500 + BONUS

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STAFFORDSHIRE** c£6,500
Systems analysts with a minimum of one year's experience are required by our client. Experience on ICL hardware an advantage. Ref: 1102

**PROGRAMMERS
NORTH WEST** To £6,000
Expanding company require COBOL programmers, commercial and financial applications. Annual bonus, pension scheme, flexible, luncheon vouchers. Ref: 1093

**SYSTEMS ANALYSTS
MANCHESTER** To £5,300
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**SYSTEMS DESIGNER
NORTH EAST** To £6,235
Design suites of programs and files with technical support team to produce efficient systems. ICL background an advantage. Lucrative productivity payment. Ref: 1076

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An opportunity to increase in seniority. Control a major site move. ICL background with COBOL and PLAN experience an advantage. Ref: 1089

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Computer bureau require COBOL programmer, ICL experience an advantage. A variety of applications. Ref: 1088

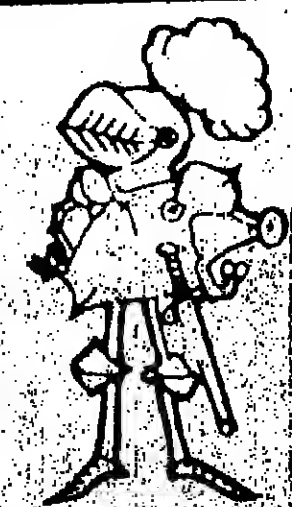
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Further particulars and application form, returnable by 26 March from Assistant Chief Constable (Personnel & Training), Kent County Constabulary, Sutton Rd., Maidstone, phone (0622) 65432 ext 212.

Kent County Council



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Call Richard or Suzy on 01-491 4706

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Application forms and further
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UNIVERSITY OF
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**APPLICATIONS
PROGRAMMER**
SPATIAL ALGORITHM
PROJECT

required to be responsible for
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Appointment will be for two years
only on the scale (under review)
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If you can answer yes to these questions and you are looking for a
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UNIVERSITY OF YORK Department of Computer Science SENIOR COMPUTER TERMINAL TECHNICIAN — GRADES

Applications are invited for the post which will involve visual display units, the maintenance and repair of the equipment used in the work. The successful candidate will have experience in the use of the equipment and a knowledge of the principles of computer operation. The salary range is £3,185 to £3,720 p.a. (scale 1).

Applications should be sent to the Deputy Secretary, University of York, Heslington, York, YO1 5DD. Closing date: Wednesday 28 March 1979.

THE UNIVERSITY OF BIRMINGHAM COMPUTER OPERATION

Applications are invited for the post of Computer Operator in the University of Birmingham. The successful candidate will be responsible for the operation of the computer system and the maintenance of the equipment. The salary range is £3,185 to £3,720 p.a. (scale 1).

Applications should be sent to the Deputy Secretary, University of Birmingham, Edgbaston, Birmingham B4 7ET. Closing date: Wednesday 28 March 1979.

2976 Our price system

NYCC

2900 — VME/B — IDMS

North Yorkshire County Council has completed transition to 2900 and is now planning to move into new applications areas. Experienced Computer personnel with drive and ability are required to join an energetic team of computer professionals supporting and developing a comprehensive 2900 VME/B BATCH, RJE, MAC and TP service for the County Council. The Computer Centre is in the Market Town of Northallerton, in the heart of North Yorkshire countryside between the North Yorkshire Moors and Yorkshire Dales and National Parks and close to York and Harrogate.

TECHNICAL SUPPORT — VME/B SUPPORT GROUP

Responsible for the development and maintenance of VME/B, superstructure products, other software products, compiler, etc.

PROJECT LEADER

£5227 to £6702

SENIOR SYSTEM PROGRAMMER

£4773 to £5668

Experience of support and development of a sophisticated operating system essential — preferably VME/B.

PROGRAMMING SUPPORT

Responsible for providing specialist programming support and consultancy to the Applications Development/Support Groups — including support of VME/B TP options and programming implementation of IDMS.

GROUP LEADER

£5513 to £7230

An experienced chief/senior programmer to undertake the leadership of the specialist team, the maintenance and development of programming standards, evaluation and introduction of new programming techniques and training of programmers.

Starting salaries, within the grades quoted above, will be paid according to experience. (Salaries quoted including supplements but not pension 4 settlement). The Council will pay removal expenses, provide assistance for payment of legal fees, a disturbance allowance and a lodging allowance in appropriate cases. Written applications giving full details of Experience, Training, Age and Current Salary together with the names and addresses of two referees to:

**HEAD OF COMPUTER SERVICES
NORTH YORKSHIRE COUNTY COUNCIL
COMPUTER CENTRE, COUNTY HALL
NORTHALLERTON DL7 8AL**

APPLICATIONS TO BE RETURNED NOT LATER THAN 23rd MARCH, 1979

DEVELOPMENT

Development functions are the responsibility of Project Groups under Group Leaders reporting to the Development Manager — each group covering a varied range of applications with responsibility for the evaluation, development and implementation of new application systems and the support/maintenance of operational applications.

GROUP LEADER — IDMS

£5513 to £7230

Experienced Project Leader/Analyst is required to undertake investigations and evaluations of IDMS, provide specialist implementation support, establish installation standards/procedures and assist in the administration of Data Base activities.

GROUP LEADER — APPLICATIONS

£5513 to £7230

Experienced Project Leader/Analyst is required to lead on Applications development/support group.

SENIOR ANALYST/ PROGRAMMERS

£4773 to £5668

Experienced of COBOL and working knowledge of a sophisticated operating system essential. Experience of analysis of systems and development of applications.

Written applications giving full details of Experience, Training, Age and Current Salary together with the names and addresses of two referees to:

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DATA CONTROL

£4000

This installation in South-West London requires a Data Controller with IBM 370 exp., although knowledge of a 3031 would be an advantage. Parks inc. Bonus, profit sharing and L/Vs.

ICL 1900

£4750

Company in West London requires Operators with 1 yr's + G II exp.-Although someone with G III knowledge would be considered.

ICL 1900

£4000

An Operator with 9 mths' experience in manual operating and/or G II required for a busy site in the City. Plenty of scope within this organisation.

HONEYWELL

up to £4500

An Operator with 1 yr's experience in OS 2000 is required by this installation in the W/End.

UNIVAC

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A senior Operator with EXEC B experience is currently being sought by this installation in South-West London.

IBM DOS

up to £5300

Operators/Snr. Operators are currently being sought by two installations in Central/East London. JCL exp., an obvious advantage. Parks inc. 3% mortgages and cheap loans.

IBM OS

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Two years' experience reqd. for this post as a senior operator at this Central London site. A working knowledge of OS JCL would be useful.

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Shift leader with 2 yrs' supervisory exp. reqd. by this West London Company. Parks include 2 shifts and free meals.

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Initial responsibilities will include assistance with implementation of the systems being written by a software house. Once the machine has been installed the Computer Operations Manager will be responsible for:-

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Candidates, male or female, aged 30 to 40, should have sound experience in computing and computer operations.

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Our small but busy ICL 2903 installation requires a young person with operating experience to fill a gap in our operations team. Knowledge of ICL utilities or JCL would be an advantage as would the ability to work without supervision. We run two half shifts and you will be required to take responsibility for your section of the shift. Starting salary up to £3,500.

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Grade AP 3 £3,732-£4,148

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The Council has an ICL 7800 Terminal linked to the Lancashire County Council ICL 2970 Computer.

The duties of the post would involve day-to-day operation of the Terminal, the training and development of computer systems and effective liaison with the Computer Liaison Office.

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Applications giving details of age, qualifications, experience, etc. together with the names and addresses of two referees, should be sent to Mr. David Parkinson and Mr. J. W. Lewis, Finance Officer, 180 Clifton Drive South, St. Anne's, Wigan, Lancashire WN1 1JL. To be received not later than Wednesday 21st May 1979.

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If you are a person who enjoys hard work in a hectic environment, has the above qualifications and wishes to participate in developing areas of technology, this would like to hear from you as soon as possible.

In return we offer a salary in the region of £5,500, a subsidised canteen, recreation club, profit-sharing scheme and pension fund.

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Mini computer or key to disc engineers ideally with experience of floppy disc systems motorole 6800/intel 8080 micro chips are required in the following areas:

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RPG II
PROGRAMMER

SOUTH COAST

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Reporting to the Company Systems Co-ordinator, the suitable applicant will be required to have a sound knowledge of RPG II. Some previous systems involvement would be an advantage. Initially the selected candidate will be involved in coding, compiling and testing of new programs and amendments to existing programs.

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Applications for this position will only be considered through Sanderson Executive; for further information please phone or write to Mike Gessley.

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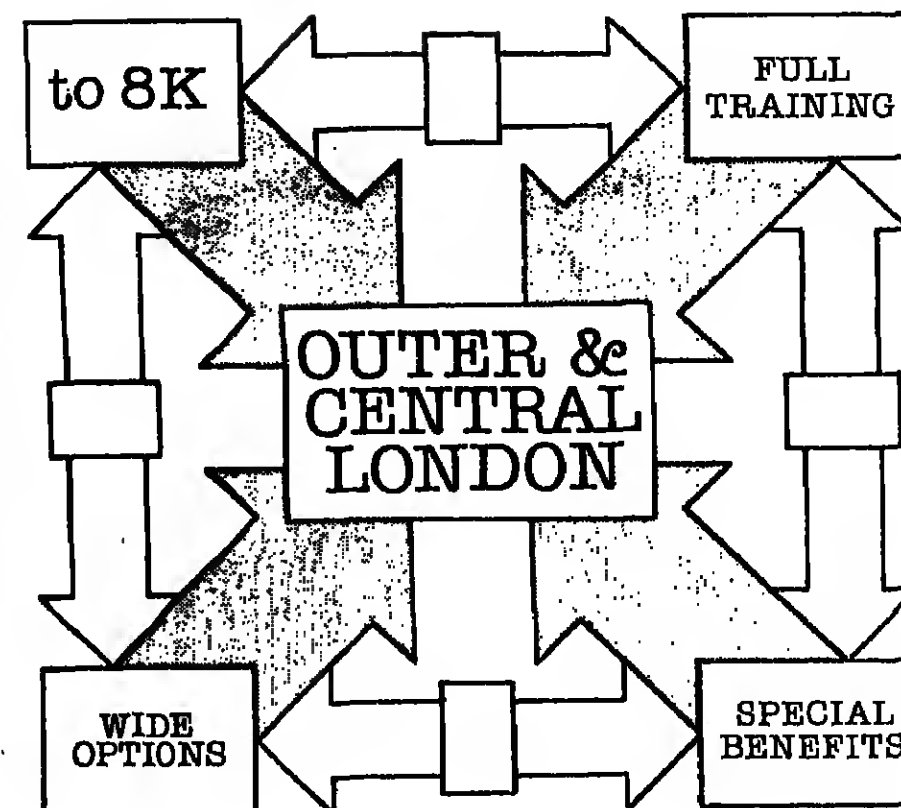
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Computing Services Association
Roberts House, 80 Manchester Road
Altrincham WA14 4PL

COMPUTER CAREERS
IN AUSTRALIA

Challenge!

For details and brochure write to Computer
Careers in Australia Agent-General for Vic.
Victoria House, Strand, London WC2R 4LG.

Get in First
Stay on Top.

Sales and
Branch Managers and
Systems Project Leaders
for rapidly expanding
business systems house

London-Manchester-Bristol-
Birmingham-Leeds-Scotland.



DATA COMMUNICATIONS
CORPORATION
Thames House, 5 Church Street
Twickenham, Middlesex TW1 5NU
Tel: 01-892 3333 Telex: 6813327

We're DCC — one of the country's fastest-growing business systems houses. We're part of an international organisation and from a standing start in the UK just over a year ago we've opened a wide range of prestige accounts in commerce, government and the utilities. If you join us now you'll be 'in on the ground-floor' with a company that respects people who get results — so your career prospects will be excellent.

Right now we need more Sales and Branch Managers and Systems Project Leaders to help us sell and install a range of proven financial packages which use the highly successful Data Communications Corporation range. They're recognised as the best in the business and cover all aspects of accounting systems, plus data collection, communications and distributed processing systems, property management and so on.

Ideally we need people who've had experience with a major manufacturer or selling financial packages at all levels... but whose career's been a bit out of pace with their expectations.

If you're in Sales you'll be given a top basic salary, (almost certainly higher than you're getting now) a Cortina 2000 and commission based on your realistic, achievable targets that will take your earnings up to the £15,000 a year bracket. For the right Systems Project Leaders they'll be given a top salary and a share in the success of the systems they're responsible for.

Just telephone Ken O'Toole (Marketing Director) on 01-892 3333 or write to us for a more convenient interview.

NORTH WESTERN REGIONAL HEALTH AUTHORITY
COMPUTER SECTION

SHIFT CONTROLLER

Salary £4,969-£5,025 per annum

Applications are invited from experienced computer people for this post in the operations section.

The person appointed will have supervisory ability and experience of controlling and scheduling the processing of data, and must be prepared to work on a shift rota basis for which an additional allowance of 15% of salary is payable. The shifts do not involve overnight or weekend work.

Application forms and further details from Regional Administrator, North Western Regional Health Authority, Gateway House, Piccadilly South, Manchester M60 7LP, or for further information telephone Mr. R. Dyson on 061-773 9211. Please quote reference number 1740A. Closing date 22nd March, 1979.

MID GLAMORGAN COUNTY COUNCIL
EDUCATION COMMITTEE

TEACHING STAFF

APPOINTMENT OF TEACHER OF COMPUTER
SCIENCE—SCALE 2

Applications are invited from graduates in an appropriate discipline or persons with equivalent qualifications for the post of Teacher of Computer Science at the Mid-Glamorgan Schools Computer Centre. Teaching or lecturing experience in Computer Science an advantage.

Application forms to be returned by 28th March, 1979, available from the Director of Education, Mid Glamorgan County Hall, Cathays Park, Cardiff.

CANVASSING WILL DISQUALIFY
W. ALWYN JONES
Director of Education

COMMUNICATIONS
—OPERATIONS
SUPPORT

The University of London Computer Centre has a vacancy in the Network Support section of the Operations Group.

The recruit will join a small group responsible for the day-to-day support of the Centre's extensive data communications network. The work is varied and involves the analysis and rectification of technical and operational problems, also liaison with users, staff and engineers. Shift working is required covering morning and evening shifts for which an allowance is paid.

Applicants should have a minimum of 6-10 years' experience of a 'A' level would be an advantage. Some knowledge of computer operations and/or workshop practice would be an advantage although not essential as training will be given. Starting salary within the range of £3752-£3785 p.a. inc. Applications in writing giving details of age, qualifications and previous employment to Mr L. Jones, University of London Computer Centre, 20 Gower Street, London WC1E 6BT. Tel. No. 01-406 6400.

£4000-£7000+

North+Midlands

Analysts &

Programmers

081-9324184

(Thames Valley University)

Sampson Staff

SALESMEN:
WARNING: SELLING MINICOMPUTERS
IS HIGHLY LUCRATIVE AND CAN
IMPROVE YOUR WEALTH...

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- 2Q? EARNINGS ... A ... GUARANTEED INCOME GUARANTEED AT YOUR PRESENT LEVEL AND ABOVE ... COMMISSION ADDITIONAL — TOTAL NOT LESS THAN £10K + CAR
- 3Q? FUTURE ... A ... ASSURED ... 1979/80 SEVERAL MORE MANAGERS REQUIRED
- 4Q? LOCATIONS ... A ... NATIONWIDE LONDON, BRISTOL, BIRMINGHAM, MANCHESTER, LEEDS
- 5Q? PROFILE ... A ... EXPERIENCED SYSTEM SALESMAN OR TECHNICAL SALES ENGINEERS TO SELL INTO EITHER COMMERCIAL OR SCIENTIFIC MARKET
- 6Q? CONTACT ... A ... IMMEDIATELY FAYE OGILVIE OR TONY McGRATH, 9.30am-6pm

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637-9611

MANAGEMENT &
EXECUTIVE SELECTION

PROGRAMMERS

SAUDI ARABIA

Informatix has been retained by some of Saudi Arabia's leading services and manufacturing organisations to assist in the recruitment of both mini and IBM mainframe Analyst/Programmers.

The prime requisite is a minimum of 5 years' COBOL, gained in a commercial environment. For the mini computer positions, the preferred machines are DEC, TI and DG, while a knowledge of DOS, TOTAL and CICS is highly desirable for the mainframe.

The companies offer an excellent remuneration package including accommodation and up to 30 days' holiday and car allowance.

Initial interviews will be held in London within the next year.

Ref: 11/1

PROJECT LEADERS/ ANALYSTS

HOME COUNTIES to £9,000+

If you have 4 years + DP experience which include programming background and have completed at least one systems project, then our clients can offer you both varied and interesting development projects on both mini and mainframes with the opportunity for overseas travel.

Ref: 11/2

ANALYST/PROGRAMMERS

CITY to £6,500

Our client, a leading financial services organisation, seeks Programmers and Analyst/Programmers with at least 2 years' experience of BASIC or FORTRAN IV to develop a wide range of real-time, on-line applications on DEC equipment. The company offer excellent career prospects with opportunities for working abroad.

Ref: 11/3

INFORMATIX UNITED KINGDOM AND OVERSEAS INDEX

Haven Informatix Limited

24 Grays Inn Road London WC1X 8HR Telephone 01-831 6055 Telex 299539 HAVEN G

RECRUITMENT CONSULTANTS

Cobol Programmer

£3,714-£5,508 (inclusive)

For one of our project teams, following a promotion, a minimum of 12 months' COBOL programming exp. is required, but the starting salary will depend on the level of experience attained.

To the suitably qual. person, we offer a progressive computing environment with on-line programming facilities and work on a wide range of applications and services, both already on the computer and in our future development plans. Opportunities exist for subsequent career progression in application programming, technical support or systems analysis. The Authority currently operates under George 3 an ICL 1804S with 192K store and in September 1978 will be taking delivery of a 2880/72 system operating under OME and VME/B.

35-hour week with flexible working hours: 22 days annual leave (rising to 28) plus 10 statutory days; staff restaurant; season ticket scheme.

Implementation Officer

£4,680-£5,067 inclusive

Implementation Officers are responsible for producing user-department Systems Manuals and for training user-department staff to understand and work with computer systems. Applicants should have plenty of commonsense, a practical approach, and the ability to write in a clear, non-technical manner and deal with staff at all levels.

We are looking for someone with experience of computer systems or, who leads that with suitable training they would be capable of undertaking this interesting work. Opportunities for subsequent career progression in systems analysis, operations control and administration.

Written applications for both posts by 23 March, stating age, qualifications and career details to date, to: Computer Services Manager, Town Hall, London SW16 2PU.

LONDON BOROUGH OF

Wandsworth

SYSTEMS ANALYSTS

SHEFFIELD

£6000

We have been retained by a major computer user based in Sheffield to recruit additional systems analysts.

The projects on which successful candidates will work cover all aspects of the company's activities, including finance, order processing and manufacturing.

Candidates should have:-

- * Good education
- * Some programming experience
- * At least 1 years analysis experience

Our client will offer:-

- * Salary around £6000
- * Relocation expenses if appropriate
- * Progressive career prospects

Contact Ivor Norton in writing or by telephone at your nearest office, quoting reference CW/79012.

Ivor Norton Management Services Ltd
Recruitment Consulting Division

24 Shaftesbury Avenue, London W1P 1DT. Tel: 01-477 2244 (local and worldwide service).
Fax: 01-477 2244. Telex: 200000. Cable: 200000. Post: 200000.

INTERNATIONAL BANK/NIGERIA

The Nigerian subsidiary of a major international bank is looking for a

DEPUTY DATA PROCESSING MANAGER

for its Lagos Head Office

The bank, which last year introduced the first 'on-line' banking system in Nigeria is currently running on two NCR 8260 computers, and to maintain its lead has recently placed an order for two 8430 systems which should be installed later this year.

The successful applicant, will be aged around 25 years of age and have an extensive knowledge of IMOS and banking operations, and be offered initially a three-year contract covering a five-figure net salary, two months leave with return fare paid for self and family at the end of each year, a tour, free accommodation and generous car allowance.

An excellent standard of living may be enjoyed with local recreational facilities including swimming, golf, rugby, soccer, tennis, badminton, etc. Dynamic young DP professionals should send their written C.V. to:

SOCIETE GENERALE
105-8 Old Broad Street, London, EC2P 2AH
Marked for the attention of
Mr. Peter Henneford

COTSWOLD DISTRICT COUNCIL FINANCE DEPARTMENT

PROGRAMMER

CIRCA £4,600 p.a.

Applications are invited from programmers with at least two years' experience of COBOL. The post encompasses the development and maintenance of programs for the Council's 320 Honeywell 220 with disc and magnetic tape. The post offers the opportunity to gain valuable experience in the development and maintenance of programs for the Council's 320 Honeywell 220 with disc and magnetic tape. The Council is based at Cheltenham and administers the financial affairs of the Council. The successful applicant will be offered a competitive salary and a pension scheme. Applications should be sent to the Finance Department, Cotswold District Council, Cheltenham, Gloucestershire, GL51 6AA. Tel: 0282 511111. Fax: 0282 511112.

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611
9.30 a.m.-9 p.m. THURS.-WEDS.
(Mar. 15, 16, 19, 20, 21)

COMPUTER ENGINEERS

The U.K. Division of this multi-million dollar minicomputer manufacturer, already well established, is undergoing rapid, uncontrolled, expansion and requires experienced engineers for a number of new positions.

In West Germany, a PRODUCT SUPPORT ENGINEER is required to be responsible for assessing new products and introducing them to the company and clients. This interesting position will demand considerable technical and liaison skills, so candidates must have a minimum two years computer engineering experience.

SALARY : £13K +

and South Wales

In Glasgow, Manchester and North London, more, experienced, COMPUTER FIELD ENGINEERS are needed to maintain the increasing number of installations in these areas. Capable engineers can expect rapid career progression within this dynamic environment.

EARNINGS : Glasgow/Manchester to £6K + car; London to £7K + car.

In Leicestershire (Leicestershire) a PRODUCT REPAIR ENGINEER is needed in the small in-house team. This is a technically challenging role with promotion to Specialist/Support Engineer available, with increased salary + car.

SALARY : to £6K +

SPECIAL BENEFITS : Assistance with relocation where necessary, BUPA, free life insurance and excellent pension scheme.

Contact Peter Gorton for details and application forms
Time 9.30 am - 9.00 pm.

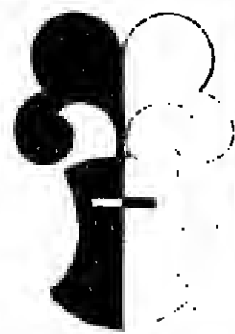
POST SALES SOFTWARE SUPPORT

In the Midlands, an experienced OPERATING SYSTEMS SPECIALIST is required to support customer installations, both there and in the North. The ideal candidate will have an all-round knowledge of both Applications and Operating Systems, but all experienced candidates will be carefully considered.

Salary : £7K to £8K + car (with Telephone)

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT &
EXECUTIVE SELECTION



KNIGHT PROGRAMMING SUPPORT LIMITED



SALES EXECUTIVES

£10,000 + PER ANNUM + CAR

K.P.S.L. is one of the fastest growing companies in D.P. and believes in rewarding good people well.

After another successful year we want to expand our Sales teams located throughout the UK and Europe.

If you have experience in the computer services industry and can demonstrate success at sales and in dealing with people we would like to hear from you.

Call David Shepherd on 01-734 0152 and discuss the many opportunities which are available.

ROYALTY HOUSE, 72 Dean Street, London W.1. 01-734 0152.



4 New Bridge Street, London EC4V 6AA. Telephone: 01-353 1867

PROJECTS LEADERS

circa £8,500
CITY

We are a well established medium sized software house, which is officially approved by Burroughs, based in the City. We have recently won some very interesting and important contracts with well known companies and organisations who are Burroughs users in the London area.

We need two people or more to system design and subsequently load these projects.

If you can show that you

- (e) have had some programming and systems experience on any COBOL based mainframe.
- (b) have had proven experience of successful project completions.
- (c) are able to talk easily and competently with clients.
- (d) are able to accept responsibility and cope with the self management that inevitably will be part of the day's work.

then we should be delighted to discuss the prospects over an informal lunch, ring Peter Robbins on 01-248 5218 for your reservation.

COMPUTER EXPRESS
(SERVICES) LIMITED

88 CARTER LANE, LONDON EC4V 6EQ
TELEPHONE NO. 01-248 5218
(SERVICES) LIMITED

c £7,500 plus
Purchasing Manager
SCOTLAND
Electronics

Graduate or equivalent. Male or female age 35-45. Professional membership and experience of electronic component purchasing essential. American company experience desirable. Career opportunity with international travel and excellent fringe benefits which include re-location expenses.

Suitably qualified candidates please phone 01-453 7117 for application form quoting MRD 8064 (24 hour answering service).

MRD

Management Recruitment Division
BOYDEN INTERNATIONAL LTD.
11/15 ARLINGTON STREET, LONDON, SW1A 1RD.
LONDON, PARIS, BRUSSELS, GENEVA, ROME, MILAN,
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MEXICO CITY, SAN PAULO, AUCKLAND, MELBOURNE,
SYDNEY, JOHANNESBURG AND THROUGHOUT THE U.K.

Chelmsford Borough Council SYSTEMS ANALYST/ PROGRAMMER

POST NO. 18
GRADE S.O.1 — £5,232 to £5,569

The Council are looking for a man or woman with sound experience to join a small data processing section in the Finance Department. The section is a Univac 90/25 mainframe with disc and magnetic tapes and it is currently being upgraded with the addition of a V.D.U. and extra store. The computer handles an interesting variety of applications, mostly financial, and these will be extended with the addition of on-line facilities. Experience with RPGII would be an advantage but candidates with experience in other high level languages, preferably COBOL or BASIC, or ASSEMBLER would be considered. Applicants with practical experience in on-line systems would have a particular advantage.

In appropriate cases the Council would be prepared to consider providing housing accommodation and a grant would be made towards removal expenses. An experimental flexitime working hours scheme is in operation. Application forms are obtainable from the Personnel Officer, Civic Centre, Chelmsford, to whom they should be returned by the 28th March, 1979.

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611
9.30 a.m.-9 p.m. THURS.-WEDS.
(Mar. 15, 16, 19, 20, 21)

SYSTEMS ANALYSTS Initially to £8½k

★ INVOLVEMENT

in new systems for mainframe and minis from feasibility to implementation.

★ IMPLEMENTING

financial, management, accounting and associated systems.

★ ESSENTIAL

— Programming knowledge.
— Systems background for senior jobs.

★ USEFUL

— IBM knowledge.

OUR CLIENT

is a world-renowned International company with the systems facility very conveniently based in London.

OPPORTUNITIES

for joining exist at all levels and career progression is both planned and expected.

BENEFITS

include those normally associated with large International companies, i.e. flexitime, a first-class pension scheme, mortgage assistance, etc.

Contact Terry Bate — 9 a.m. to 9 p.m.

IBM 370 RELOCATION ENGINEERS

An unusual and exceptional opportunity has just arisen for two experienced IBM 370 series engineers to join the new division of an internationally renowned company.

International
Based London

to £13K package
plus car

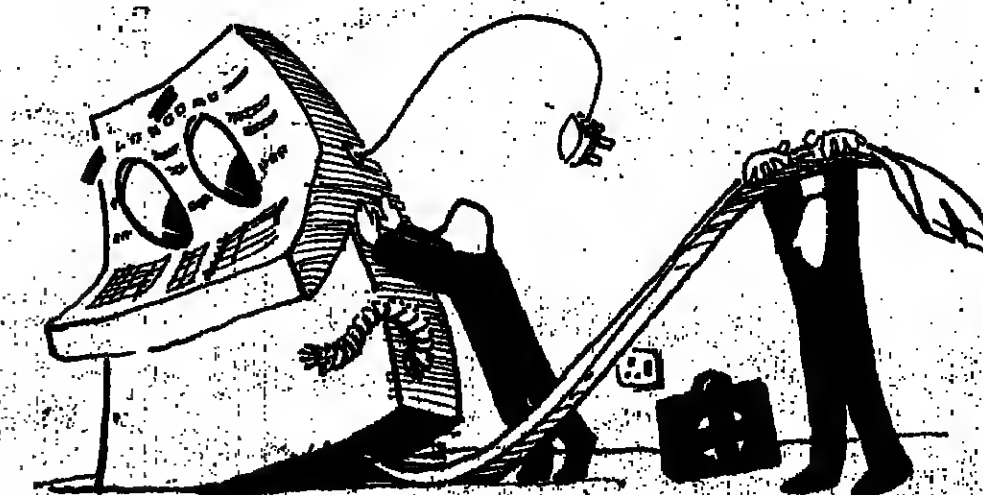
Those of you who prefer an independent, technically demanding role and thrive on variety, responsibility and challenge will definitely enjoy the work, which centres on the relocation of IBM 370 series mainframes across Europe. International travel is a fundamental feature, but trips are planned well in advance — unlike "Support." Time off in lieu/O.T. payments are provided an exceptional career progression is virtually assured.

Ideal candidates will have 145/158 experience but all applications will be carefully considered.

The additional benefits provided are very generous.

For the opportunity to go far quickly — contact Peter Gorton. 9.30 a.m.-9 p.m.

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611



MANAGEMENT &
EXECUTIVE SELECTION

Anglian Water Authority

SYSTEMS ANALYST

Up to £7.5K (NJC Grade 9)

Post Ref: H3D037

As one of the most advanced Honeywell large users in the UK we're into database and TP in a big way, using Honeywell's latest and best software.

Our first applications are underway. We now need another systems analyst to take responsibility for large scale integrated systems in the SCIENTIFIC AND TECHNICAL area.

If you're an ANALYST with at least 5 years' systems experience you may fit the bill. The opportunity exists to gain experience of T/P and Database techniques — it'll be up to you to make your mark! Don't worry if your experience is not with Honeywell — we'll train you.

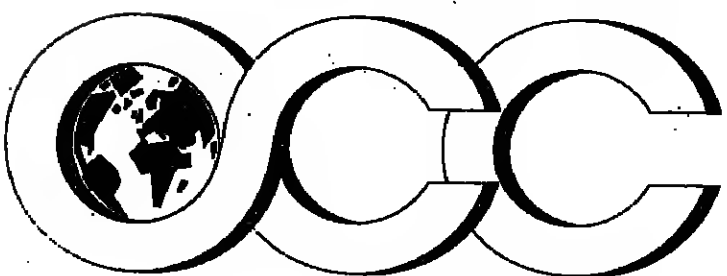
The closing date for application is 30th March, 1979, and should be sent to:

Miss Jenny Spencer
ANGLIAN WATER AUTHORITY
Diploma House, Grammar School Walk, Huntingdon, Cambs. PE18 6NZ

We're located in Huntingdon, an area of reasonable housing costs which offers a wide range of leisure pursuits. With Cambridge only a half-an-hour away — and within 1 hour of London by train, the overall quality of life is high.

The Authority offers excellent conditions of service and generous removal expenses if relocation is necessary.

If you're interested or want to know more about this opportunity, call Jenny Spencer at Huntingdon (0480) 58181 Ext. 370 for information and an application form.



Software Specialists

to join the Communications Group
of a leading Systems Consultancy
£5,000 - £10,000

if your experience has included:-

- Message Switching
- Computer Systems basic software
- Communications networks
- Railway Signalling
- Emulators for mainframe terminals
- Software for the Media

or any communications software, our client would like to discuss the wide range of projects and opportunities that exist in their Communications Group.

Salaries and benefits are excellent, the projects are very interesting and opportunities unlimited.

The posts are based in London, although there will be opportunities to travel both abroad and within the U.K.

To apply for these vacancies, or for further information, please write or phone, asking for Clive Wright quoting reference 488/CW. Day 01-242 9356. Evenings and weekends East Grinstead (0342) 22270.

OCC Computer Personnel Limited,
16 Bedford Row,
London WC1R 4EB.
Telephone 01-242 9356



BE YOUR OWN BOSS

An exceptional opportunity is available to a limited number of experienced, competent and ambitious programmer/analysts throughout the U.K. who have some minicomputer and business applications experience.

If you feel you have the ability and strength of character to own your own business, but are handicapped by only having limited capital, then write to us now with full C.V. address and home telephone number. All replies will be dealt with in the strictest confidence.

If you qualify for this scheme, very substantial finance and management facilities will be placed at your disposal for only a nominal capital investment.

High fliers contact us now at Box 1009, Computer Weekly.

SERVICE ENGINEERS

NEW CAREER
CIRCA £8,500 + Car

A new company (secure European backing) has introduced unique Micro based computer in the U.K. and requires a bright young computer Service/Engineer to set up a service facility from scratch. You will visit Holland for all product training, enjoy lots of personal contacts, live in Southern England or be prepared to relocate. If you have good academic background, computer experience, can communicate, then take a big stride forward to a really exciting new career with excellent future prospects.

Start circa £8,500 plus per plus expenses. Call now. Ref: E.K. 2144.

A.B. EXECUTIVE LTD.
01 563 1442

JOHNSON GROUP CLEANERS LTD. requires a COMPUTER OPERATOR

An opportunity has arisen, due to the introduction of computerised working, for a service operator with "one year" plus experience of J.C.L. 2003/A or 1800 machines. If you have a good academic background, computer experience, can communicate, then take a big stride forward to a really exciting new career with excellent future prospects.

Start circa £8,500 plus per plus expenses. Call now. Ref: E.K. 2144.

A.B. EXECUTIVE LTD.
01 563 1442

Systems Analysts (South Yorks)

International Harvester is a major manufacturer and marketer of Industrial, Agricultural and Construction equipment. Expansion within the Information Systems Services Division located at Doncaster has created a number of vacancies.

The installation comprises a Honeywell level 66, with large database applications and on-line systems. These techniques are being further developed along with distributive processing and consequently there exists tremendous career opportunities for the right candidates.

The applicants must be experienced Systems Analysts with a firm grounding in systems design and application.

Location. The offices are situated some 2 miles from the town centre, within easy reach of attractive countryside, and motorway network. It is a lower priced housing area, and if applicable, there is a good relocation package available.

The benefits. Salaries will be negotiated according to experience. The usual large company benefits apply: e.g. 4 weeks holiday, bonus scheme, overtime paid, pension and sickness schemes, etc. If you are interested and would like to know more about these vacancies, write with details or phone (reversing charges):

Patrick Hand, Training Centre, International Harvester Co. of GB Ltd., Wheatley Hall Road, Doncaster, South Yorkshire DN2 4PG. Tel: 0302 66631 Ext. 111.

INTERNATIONAL HARVESTER

PROGRAMMER/ANALYST INVERNESS

John G. McGregor (Holdings) Ltd., the parent company of one of the largest construction groups in the North of Scotland is looking for an experienced and ambitious Programmer to programme and implement commercial systems on an

IBM SYSTEM 38

Ideally the successful candidate should be self-motivated and have 2 to 3 years experience of RPG II. Experience of on-line systems and/or the construction industry would be an advantage.

Initial responsibilities will include

- Transferring applications from the current computerised systems.
- The enhancement of those systems to utilise on-line and data base facilities of system 38.
- Involvement in the continued development of data processing in an expanding group.

This position offers an attractive salary and an excellent career opportunity for the right candidate.

Please apply in writing giving full details of career and salary progression to date to:

A.J. O'Neill, Financial Director,
JOHN G. MCGREGOR (HOLDINGS) LTD.,
Seaford Road, Inverness IV1 1SJ.

MCGREGOR

FREELANCERS

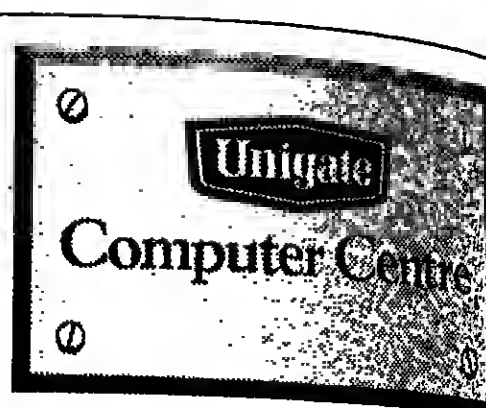
Major Consultancy working through the UK and abroad require

MEN OR WOMEN ANALYSTS/PROGRAMMERS

with initiative to work on small business and scientific systems mainly in the Midlands. Experience with mini-computers and production systems programmed in BASIC would be an advantage.

Please write with an outline of career to date, stating degree of competence in languages and machines used. Please also indicate availability.

Box 1016 COMPUTER WEEKLY



Univac Systems Programmer EXEC 8

With a turnover in excess of £200 million and nearly 10,000 employees, Unigate Foods is the largest manufacturer of dairy products in Great Britain. At our computer centre at Trowbridge we are about to replace existing mainframes with a new Univac 1100/42, with both on-line and remote batch terminals. As a result, we need a Senior Systems Programmer (Exec 8) to join a small but highly professional team responsible for implementing, maintaining and developing the new operating system. In addition to analysing, monitoring and applying software provided by the manufacturer, and other outside sources, you'll have plenty of scope for designing more sophisticated in-house software.

Probably aged 25-35, you should already have Univac 1100 experience and wish to consolidate on a brand new installation. Exceptional candidates with in-depth experience of other systems will also be considered. Assembly experience is essential.

Salary according to experience up to £6,100 p.a. and will be reviewed mid-year. Other fringe benefits are both comprehensive and generous and include assistance with relocation to this most attractive part of Wiltshire.

Written letters of application to:
Mrs. B. Hewitt, Personnel Officer, Unigate Foods Limited,
Bytham Road, Trowbridge, Wiltshire.



Analyst/Programmer Mini-Computer Devon C.£6,000

Farley Health Products Limited a member of the Glaxo Group, is located in Plymouth and manufactures and markets a range of Food and Health Products. We currently use a small general automation mini-computer and plan to extend its use into the fields of inventory control, budgeting and accounting. We are looking for an Analyst/Programmer with mini-computer experience to be responsible for the technical design and programming of new work, as well as the maintenance of existing programmes. Help and advice on systems design is available if necessary, from the group, but the person selected must be self-sufficient technically. All necessary conversion training will be arranged.

Along with the envisaged salary of £6,000, we offer fringe benefits and career opportunities appropriate to members of a major pharmaceutical group. Please apply, in writing, for an application form, giving brief details of age, education and experience to Mrs. E. M. R. Clement, Personnel Officer.

Farley Health Products Ltd.
Tor Lane, Plymouth, Devon PL3 5UA. Tel: Plymouth 21000.
A Glaxo Group Company

CITY OF BIRMINGHAM EDUCATION DEPARTMENT MICRO-ELECTRONICS DEVELOPMENT TEACHER

The Birmingham Educational Computing Centre has a vacancy for a teacher who will take responsibility for the development of micro-electronic courses and applications in schools. This is a new post and offers considerable scope for a teacher with imagination, initiative and curriculum development skills to help Birmingham schools to take full advantage of the electronic revolution. Up to Scale 2 will be paid for a full-time post.

Further details and an application form may be obtained from Mr. P. D. R. Vincent, Director, B.E.C. Centre, 10, South Eastern Technical College, Hope Street, Birmingham B5 7TA. There is a scheme for assistance with removal costs.

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611
9.30-9pm THURS to WEDS
(March 15, 16, 19, 20, 21)

JOIN A TOP TEAM AND SCORE IN CONSULTANCY TO £8K +

Head Office in Buckinghamshire and projects throughout London and Home Counties

All consultancy is done on site, but you will not need to work away from home or travel undue distances.

Travelling expenses are paid, salary is excellent and benefits generous.

OUR CLIENT OFFERS

- ★ Variety
- ★ Good Pay
- ★ Profit Sharing

CAN YOU OFFER

- ★ Commercial mainframe background?
- ★ Superior knowledge of COBOL, Assembler or PL1?
- ★ The ability to work on own initiative?

So, if you want a worthwhile career in a young, sociable company which will reward you for your hard work, then

PROGRAMMERS ANALYST/PROGRAMMERS ANALYSTS

**£5-6K
c.£7K
c.£8K**

Phone Derek Pearson 9.30am to 9pm

Suite 201/6 Albany House, 324 Regent Street, London W1R 5AA. 01-637 9611

**MANAGEMENT &
EXECUTIVE SELECTION**

BLACKWOOD ASSOCIATES WEST MIDLANDS PROGRAMMERS

**£4500 to £6000
COBOL**

- ★ 2 years' Programming experience
- ★ Relocation expenses where appropriate
- ★ Preferably under 28

INTERESTED? Contact us now
Job Ref. 4/213

GP House, 155 Hamstead Road, Handsworth
Birmingham B20 2RL
Telephone: 021-523 4520 (24 Hours) or 021-551 2357
Phone or write (no stamp required) to:

Blackwood Associates, FREEPOST,
Birmingham B20 1BR

All opportunities open to male and female applicants
Registered under the Employment Agencies Act
1973 - Reg. No. M93.

Tbar Ready to switch?

£9,500 +
Commission

Are you a Sales Executive whose track record could justify a basic £9,500 a year plus car - with much higher potential earnings?

So, here's a first-class opportunity to move towards management and really prove your worth with a company who will support you if you make the switch.

At T-Bar International (Europe) we are rapidly expanding our sales of unique, technologically advanced Computer Switching Systems to the IBM Multi-Processor user market. With more than 300 systems installed in the U.S.A. with many blue chip customers we know we will succeed and as a progressive company we will welcome your dynamic approach, initiative and ability to exploit a growing market.

Although based mainly in the U.K. there will be some opportunity of European travel from time to time.

In addition to the very good salary and company car, commission earnings are based on realistic targets and there's four weeks' annual holiday, company pension scheme, free life insurance, BUPA membership and training in the U.S.A.

Hence, selling our computer peripherals is definitely more than a minor step in your career.

Contact: Rachel McCormick, PER, Sun Alliance
House, 60 Oxford Road, Reading, Berks. Telephone: (0734) 595666.

Applications from both men and women are welcome.

PER
Professional
& Executive
Recruitment

DP Manager

£6000 + car Elstree

Our client, which is part of a large international group, is looking for a Data Processing Manager to run a Honeywell 62/80 remote terminal system and control a small staff. Applicants, men or women, should preferably have experience on similar equipment.

A salary of at least £6000 is envisaged and a company car will be provided.

Please write, with all relevant particulars, to position Number AWD7226, Austin Knight Limited, London W1A 1DS.

Applications are forwarded to the client concerned, therefore companies in which you are not interested should be listed in a covering letter to the Position Number Supervisor.

AK ADVERTISING

GRAMPAN HEALTH BOARD
Appointments to the Computer Department, Forresterhill, Aberdeen.
The following vacancies exist at the Grampian Health Board's Computing Centre, Forresterhill, Aberdeen. The Grampian Health Board is responsible for the planning and overall control of Health Care Services for a population of almost 450,000 in the North East of Scotland.

SENIOR SYSTEMS DESIGNERS

Salary £5537-£6715

Candidates should have considerable experience of Systems Analysis and Design. Expertise in the application of Database Management Techniques, large indexes and/or formal qualifications would be an advantage. The persons appointed will assume responsibility for major projects, including patient indexes and hospital administration systems.

SENIOR PROGRAMMER/ANALYST

Salary £4889-£5028

Candidates should have significant experience in the design of computer systems and formal qualifications would be an advantage.

PROGRAMMER/ANALYSTS

Salary £4421-£5328

Candidates should have at least two years' programming experience and, preferably, formal qualifications.

Candidates with insufficient experience for these posts may be appointed but on a lower scale.

The work involves standard financial systems, the development of Patient Indexes, a medical information system (using a Codevyl database), hospital administration and stock control systems, and the production of statistics on in-patient care.

Application forms and further details of these posts are available from the:

Area Personnel Officer
Grampian Health Board,
1 Albany Place, ABERDEEN. AB9 1RE

Telephone: 0224 29901 extension 3227.

Closing date: 8th April, 1979.

COMPUTER OUTPUT MICROFILM BUREAU

Rapidly expanding COM Bureau has vacancies for experienced and trained

TECHNICAL SUPPORT ANALYSTS and OPERATORS

Technical Support Staff are responsible for testing, implementing and maintaining software on sophisticated COM recorders for Client applications (105mm Microfilm and 16mm Microfilm) and assisting in pre-sales situations.

Operations staff work a four shift system and are responsible for the production of high quality COM output within specified turnaround times for the Client base.

Attractive salary and benefits are offered commensurate with age, ability and experience.

Please apply in writing with personnel and career details to:

Mr. A. H. Bates
Technical Services Manager
COM Services Division
Financial Data Services Limited
6 Salem Road, ABU

London W2 4BU
or telephone 01-228 9431 for an application form

HERTS and NORTH LONDON

ANALYSTS £5500/£6000
PROGRAMMERS £4500/£5500

Haymarket Computing are D.P. recruitment consultants to 35 companies in the Herts/North London area, and are currently anxious to meet Analysts, Analyst/Programmers and Programmers on behalf of clients located in Potters Bar, Tottenham, Wembley, Edmonton, Cockfosters and Watlington Cross.

Applicants will be invited to look through our client register which details the companies, positions, salaries, prospects, etc., so that we may jointly choose the vacancies best suited to your requirements and experience.

For more information ring:

HAYMARKET
COMPUTING LTD.
Tel. 0181 (Herts) 41310
Fax 0181 41310



Systems Programmer

Following the recent installation of a 4Mb IBM 3031 at the Filton site, we have a vacancy for an experienced Systems Programmer to assist in the conversion from SVS to MVS in the coming months.

We would like to hear from you if you have at least 2 years' SVS or MVS experience in some or all of the following:

Systems Generation
System Maintenance (SMP)
HASP/JES2
TSO
Assembler
TCAM/VTAM
Programme Product Implementation

We provide an extensive TSO network, centred in Bristol, for the whole of the Weybridge/Bristol Division in addition to links with the Weybridge Installation.

Conditions of employment include a first-class contributory pension scheme, free sick pay and life assurance, and excellent welfare, social and sports facilities.

Please telephone or write for an application form to:-

Employment Manager (Ref: AIR/7)
British Aerospace Aircraft Group,
Filton House,
Bristol BS99 7AR
Tel: Bristol 653031 Ext. 140

BRITISH AEROSPACE
AIRCRAFT GROUP
Filton

CAREER OPPORTUNITIES IN OPERATIONS

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Up to £4418

Due to internal promotion a post is now available. It offers valuable opportunity to develop your career in computing.

- ★ Experience with the latest UNIVAC 1100 mainframe equipment
- ★ Operating with an expanding communications network
- ★ Good training and career development opportunities

OTHER BENEFITS

Wide range of relocation allowances, restaurant, free parking, two shift systems with no regular weekend working (salary shown is inclusive of shift allowances), Staff Club, disco, squash, tennis, etc.

THE FUTURE

We've started a comprehensive expansion programme in hardware, systems, staff and accommodation. WHY NOT EXPAND WITH US?

If you have a minimum of 6-12 months' experience of medium/large mainframe installation and are interested - phone or write (with details about yourself) to - Peter Brown, Computer Services Division, County Hall, Kingston-upon-Thames. Tel: 01-848 1080 Ext. 347.

SURREY COUNTY COUNCIL



Computer Programmer

Salary £3368-£4148 p.a. inclusive

Our small and enthusiastic 2803 Computer Department requires a Programmer with two or more years' experience on a 1800/2803 Computer (preferably RPG 2) to work on batch and on-line development in financial and non-financial fields. The Council has just moved into newly completed modern offices, with a purpose built computer room and delightful rural surroundings.

Starting salary according to experience and removal/disturbance allowances up to £500 will be paid.

Temporary housing accommodation can also be made available in appropriate circumstances. Full details and application forms obtainable from: Management Services and Personnel Officer, South Norfolk House, Swan Lane, Long Stratton, Norwich NR18 2XE. Closing date: 2nd April.

SOUTH NORFOLK District Council

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611
9.30 a.m.-9 p.m. THURS.-WEDS.
(Mar. 15, 16, 19, 20, 21)

IBM 370 Specialists

To be one of IBM's major competitors, you have to be good. That means you have to have good systems, competitive pricing, and excellent people.

They already have the systems, the pricing and many of the best people, but more people are needed. After all, as our client recognises, frontrunners cannot afford to stand still. — And neither can you.



ENGINEERING SUPPORT To £15K

Whether your speciality be Technical Support or Field Service, this company can offer you an exceptional future operating in the U.K. and/or internationally.

A variety of positions are available. For contact Peter Gorton or Alan Slater any time between 9.30 a.m. and 9 p.m.

SOFTWARE SUPPORT To £15K

SENIOR AND JUNIOR positions are available in Customer Support, Marketing Support and Product Development. You will have knowledge of IBM Systems Software, OS, DOS, MVS. Experience of

CICS/VS, IMS/VS would also be an advantage. Contact Tony McGrath for immediate interview, 9.30 a.m.-9 p.m.

For all positions requiring mobility, a company car and expenses will be furnished.

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MANAGEMENT & EXECUTIVE SELECTION

MANAGEMENT & EXECUTIVE SELECTION

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

CHOICE AND CHALLENGE in a career with Software Sciences

FASHION TO FINANCE

The work of our Small Business Systems Group is computing at its most satisfying. Take, for example, the Group's Garment Manufacturers System, a hardware/software package for an industry with problems you wouldn't believe. It's a total system—which integrates stock and production control, documentation, and accounting—designed for hands-on operation by existing staff. But from identifying the need to completion of the package took just six months—and it's the next step in system design and programming you're ever likely to see.

The Small Business Systems Group supports the IBM Systems 32, 34, 38, and 5110 with both tailor-made systems and industry-specialised packages. Success in this area has created a number of exciting opportunities for programmers and analysts with experience of RPG11 or BASIC who want variety, responsibility, and opportunity in their careers.

Your job will be to make a significant personal contribution to the design and programming of these systems through your professional skills. You will rapidly gain wide experience of many applications in a range of user areas from the garment industry to some of the most specialised areas of the City. You will have the opportunity to promote your own ideas for product improvement and new products. You will gain valuable experience of direct client contact. And you will have the chance of using a powerful set of programming aids and to contribute to their improvement.

REAL-TIME PROGRAMMERS - THE IDEAL SETTING

Few areas of computer application offer the challenge, interest, and scope of the printing and newspaper industry. Few computing services companies can match the career opportunities and job satisfaction of Software Sciences Comprite, the leading UK supplier of computer based systems in this field.

Our systems currently produce Bibles in France, dictionaries in Germany, scientific text books in Russia, consumer magazines in Brazil, best sellers in Britain, and newspapers throughout the world. We are based at Warminster, Wiltshire; there you will find a volume of hardware—for program development and under test—which would put a manufacturer to shame, and you'll find the attention to advanced programming on design techniques which characterises the Software Sciences Group—European leaders in the software and systems industry.

We are now looking for real-time programmers, at several levels, who can take advantage of the unique opportunities we offer to build their careers in computing. Successful candidates will work on a mixture of development projects and enhancement to our current installations and packaged systems. You should have good experience of minicomputer Assembler languages in a real-time environment—preferably on Nova, Eclipse, or Micro 16 systems. Experience with intelligent terminal devices would be an advantage. For one of the vacancies we are also looking for Project Management experience. In all cases there may be opportunities for travel and client contact.

MICROS OR MINIS

The continuing success of the Software Sciences Group has created a variety of openings for career-minded designers and programmers. They include opportunities in both the mainstream of company activities and the exciting new area of microprocessor applications.

Programmers and Designers at Farnborough or Macclesfield

We have vacancies at a number of levels, from programmer with a minimum of three years experience to systems designers with, say, eight years plus in computing. Depending on your experience, specialist skills, and location preference, you will make an immediate start on one of a range of important projects in, for example, defence, business systems, or process control. In each of these areas we are industry leaders, and in any of them you will find all the opportunities you need for personal achievement, job satisfaction, and career development.

With a Group as diverse as Software Sciences there is likely to be an opening whatever your qualifications, but we are particularly looking for mini experience in either commercial or high reliability real-time applications. Your hardware background may be on DEC, Data General, Ferranti, Burroughs, or GEC; and you should have a comprehensive knowledge of one or more of Coral, RTL2, Assembler, Basic, Basic+, or Argue or Burroughs software.

Software Sciences is a European leader in software and systems so offers the career opportunities, rewards, and corporate backing to be expected at the top of the industry. At the same time we place a special emphasis on the product approach to industry-specialised hardware/software packaged systems and our work in this area is concentrated in our London office.

All that makes the Small Business Systems Group the right place to be at the right time if you are looking for the ideal combination of personal motivation and job satisfaction in a career minded company.

If you would like to join in the early days of the small business boom, please send your c.v. to Sarah Chambers at our Farnborough Head Office or telephone or write for an application form. Interviews will be held in London. If you would prefer to discuss these vacancies informally first, then please telephone Peter Hatt, Manager of the Small Business Systems Group, at our London office (01 405 5993).

Software Sciences Comprite is the printing industry specialist subsidiary within the Software Sciences Group. It offers, therefore, an ideal opportunity for individual achievement based on personal responsibility and job satisfaction and backed by the strength and resources of one of the computing industry's leaders.

If that sounds like the opportunity you are looking for then please send your C.V. to Sarah Chambers, at the Group's Farnborough head office, or contact her by letter or telephone for an application form.

Commercial Programmers and Analysts £5.5k-£8.5k

London-
based

Computers in Print £5k-£7.5k

Warminster-
based

Designers and Programmers for Bedford, Farnborough or Macclesfield

Microprocessor systems

Software Sciences has been at the forefront of the microprocessor revolution and has already successfully applied this new technology to a number of major projects including currency exchange, point of sale terminals, and the UK bookshop Teleordering system. We believe that our commitment to this area is second to none in the UK software industry, and even the United States is buying our application expertise in this field.

In Software Sciences Micrologic we have a total 'design and build' capability for the application of microprocessors. This creates exceptional prospects for programmers and designers who can contribute to our growth in this area. Vacancies are in Bedford and there are opportunities to develop your career in a number of ways, from microprocessor software specialisation to a variety of management roles.

If you are interested in any of these vacancies please send your c.v. to Sarah Chambers at our Farnborough head office, indicating your preference. Alternatively, you may contact her by telephone or letter for an application form.

datascene international

IBM & ICL MAINFRAMES

IBM 370 OS £5400
Deputy supervisor required by large Travel Co. 3 yrs + OS experience with some JCL knowledge. Excellent perks + prospects.

IBM 370 OS £5000
North London Financial Installation requires senior operators with 2 yrs + experience. Perks include mortgage allowance.

IBM 370 OS £4400
Operators with 6 mths+ experience required by busy City based installation. Good prospects and plenty of free time.

IBM 370 DOS £4500
Vacancies exist in all areas for operators with 6 mths+ experience. In a variety of installations offering a wide range of benefits.

ICL 1900 £4000
City based installation requires an operator with 1 yrs experience, preferably on GIL. 2 shifts only and annual bonus.

ICL 2900 £4250
Shift Leader required with 2 yrs+ 1900 or 2900 experience. 2 shift working only and some company product discounts.

ICL 1900 £5200
Shift Leader with 3 yrs+ GIL experience including knowledge of Macros required by manufacturing Co. 2 shifts only, salary currently under review.

DATA CONTROLLERS
URGENTLY REQUIRED IN ALL AREAS
SALARIES £3000-£6000

ICL 1900 OPERATORS

East London to £3800 + BONUS

Our Client, the east London Computer Centre of a large Service Organisation requires operations staff with 6 months+ 1900 experience. The hardware at present consists of a 1904A running under GIL. A replacement 1904S is planned later this year with a 2960 next year.

The company can offer excellent career prospects to ambitious operators. There are opportunities for proficient staff to move off shift into Programming, Production Control or Technical Support after a period of 2 years.

Other benefits include a quarterly productivity bonus scheme, opportunities for overtime, subsidised staff restaurant, pension scheme, and midweek rest days etc.

For further details call

Mike Harmer on 01.439.7871

OTHER MAINFRAMES

HONEYWELL GCOS £4600
Minimum of one years experience for senior operator on a large 66 system. Pleasant location and career prospects are excellent.

HONEYWELL OS-2000 £4500
18 months experience required for company in N.V. London. The main advantage of this position is no night shifts.

UNIVAC EXEC 8 up to £6000
At least three years experience needed for Senior Operator in an installation in C. London. A thorough knowledge of 1100 series is necessary for this no night post.

UNIVAC OS 3 £4300
Senior operator with 18 months experience using OS3 is required for a fast developing site with two shifts.

NCR B1 £4000
Six months experience needed for junior operators post. All banking perks apply and no night shifts.

NCR ANY £4200
An operator with 18 months good NCR experience who is ready for the CRITERION range is required for 3 shift job.

DATA CONTROLLERS
URGENTLY REQUIRED IN ALL AREAS
SALARIES £3000-£6000

COBOL ANALYST/PROGRAMMERS

C. London to £6300
One of the country's largest retail organisations is seeking several people with a COBOL background, but with an interest in other languages. They use a 370/145 & have development projects for a 3031 in COBOL, ASSEMBLER & DL1, & you will need around 18 MONTHS or more in any of these languages.

Any Analysis or D/B experience would be helpful; however, training will be provided, making this an ideal opportunity to diversify your career.

Reference PG 11/1

PL1 PROGRAMMERS

City to £6500 + Mortgage
A national financial group require good PL1 programmers to work on their twin 370/155's & PDP 11 equipment. They need around 15 MONTHS experience or more in PL1, COBOL or ASSEMBLER, & would also be willing to retrain in BASIC+ for new work on the PDP 11's.

Other attractions include Flextime, Bonuses, and Subsidised Mortgages & Loans after 6 months.

Reference PG 11/2

CONTRACTS

PROGRAMMERS & ANALYSTS REGISTER NOW FOR IMMEDIATE & FORTHCOMING REQUIREMENTS THROUGHOUT

LONDON * U.K. * EUROPE

DUE TO OUR CONTINUALLY CHANGING REQUIREMENTS WE ARE ALWAYS INTERESTED IN HEARING FROM COMPUTER PROFESSIONALS WITH A SOLID D.P. BACKGROUND TO WORK WITH MAJOR CLIENTS WHO ARE ALWAYS ABLE TO OFFER A WIDE VARIETY OF INTERESTING & CHALLENGING REQUIREMENTS.

REMEMBER: WE PROVIDE TOP CONTRACTS
WE PAY TOP RATES

CALL

BOB EDWARDS

TELEX 25851

01.439.1856

RPG II PROGRAMMERS

City to £5500 + Mortgage

A large international bank urgently requires two capable RPG II Programmers to work on a whole range of financial applications on their IBM SYSTEM 34.

All you will need is around 12 MONTHS' RPG II experience, on any machine, and not necessarily within the financial field.

The appointments will offer good career opportunities and future exposure to Systems Analysis, as well as a Non-Contributory pension, Season Ticket loans and a 3% Mortgage.

Reference PG 11/6

DATA PROCESSING MANAGER

C. London to £28500
An international manufacturing company is seeking a capable & mature DP professional to assume total responsibility for their computer centre. Your background should include at least 4 years in DP up to Senior A/P or S/A level, & any proven management experience would be of particular interest.

With an excellent benefits package included, this could be your ideal next step.

Reference PG 11/7

TECHNICAL CONSULTANT

C. London £28000
For people interested in the Software House environment there are currently vacancies in the Real Time and Communications fields within one of the best companies in London. You should have 5 years experience in either message switching applications, sales support, PDP 11's, turnkey systems or data communications and wish to progress into a Technical Sales/Sales Support Role. The company offers an excellent salary plus a full pension scheme, interest free season ticket loans, L.V.'s, staff purchase facilities and a house purchase scheme.

Reference HK 11/3

BASIC+ /BASIC+2 PROGRAMMERS

London & Home Counties to £8500
We have several vacancies for programmers with at least 18 MONTHS' BASIC+ or BASIC+2. The vacancies range from Software Houses to in-house users. If you have experience on any mini using these languages please contact us now quoting the reference below.

Reference HK 11/4

ASSEMBLER PROGRAMMERS

C. London to £7500
This country's foremost System House is currently seeking as a matter of urgency several PDP 11 Macro Assembler Programmers & Analyst/Programmers. Your background should include at least 18 months programming in Assembler, not necessarily gained on PDP 11 equipment. In fact, if you have Mainframe Assembler experience and would like to transfer over to Mini systems these openings will provide the ideal opportunity. Any exposure to analysis will be more than welcome. The projects will all be pure development work in on-line systems for various large international PDP 11 users, and for the successful applicants there will be a real possibility of worldwide travel. The career opportunities are quite diverse ranging from Internal Management & Customer Support to Marketing & even Sales. On top of this they offer an excellent salary coupled with all the fringe benefits you would expect from a large company.

Reference HK 11/5

FORTRAN ANALYST/PROGRAMMERS

City to £7600

The Data Processing Division of a long established civil engineering giant is seeking a capable Analyst/Programmer to work on their growing range of products. These vary from management information packages to financial and technical modelling, with graphics. A minimum of 2 years FORTRAN coupled with some analysis is required and any knowledge of graphics would be an advantage. The company offers very good salaries with all the usual large company benefits.

Reference HK 11/8

H/W & SW ENGINEERS

London & Home Counties £4k - £9k

We have several vacancies for Hardware and Software engineers with commissioning or installation experience. Candidates should either have an electronics qualification (BSc/HNC) or good manufacturers experience. Knowledge of BASIC+, ASSEMBLER, FORTRAN or APL would be of distinct advantage, gained on either Mainframes, Minis or Micros.

Reference HK 11/9

Software Sciences Limited

(Head Office) Abbey House 282/292 Farnborough Road, Farnborough Hampshire GU14 7NB Telephone 0252 44321

Offices in Amsterdam Bedford Brussels London Macclesfield Rugby Stockholm United States Warminster Wiesbaden

Datascene Recruitment Ltd.

Sceptre House
169-173 Regent Street
London W1R 7FB 01-439 7871

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Computing
Association

Datascene International Ltd. Telex: 25851

Sceptre House
169-173 Regent Street
London W1R 7FB 01-439 1856

Substantial advanced technology opportunities in South Africa

Project Managers Software Consultants Computer Engineers

ICL in South Africa generates a substantial proportion of the Group's total international business. (In 1978 ICL Group turnover worldwide was up 22% to over £500 million). So we're big, we're stable, we're growing and we're amongst the first countries in the world to implement some of ICL's latest systems.

Our new range of 2900's represents one of the most advanced operating systems. Installation is therefore a demanding technological challenge.

Our fast growth leads to a 20% yearly increase in our staff. As a consequence, we are looking for top people who are technically competent in their specialist field. Obviously, previous experience on ICL equipment would be a considerable advantage.

Our specific requirements are as follows, and significant additional benefits go with all these appointments.

Project Manager c R25,000

You would plan and manage new projects from their inception, leading and co-ordinating on-site project teams of up to 40 software and hardware specialists. You would be the main link between the customer and your specialists until the installation is in operation (on average about a year).

If you have Project Management experience we can offer you the opportunity to enjoy and outstanding technological challenge and earn around R25,000.

You will have difficulty in finding a position with a technical challenge or benefits equal to those you'll find with us.

Software Consultants R18,000-20,000

Our project teams need specialists with expertise in one or more of the following areas:

- Communications
- Operating Systems
- Performance
- Conversion/Transition
- Superstructure

Experience on ICL equipment is obviously an advantage, but exposure to any large operating system is a recommendation. These are challenging positions, needing specialists of a high technical calibre, and we are offering a salary of R18,000-20,000.

Computer Engineers c R14,000

Our Computer Engineers work in the style of the 1980's maintaining our new 2900 range. Any servicing therefore presents modern challenges that may involve software as much as hardware.

That's why we have become one of the first overseas ICL companies to develop a new-style Customer Service Division.

This is your chance to widen your software horizons. We would give you comprehensive training at our advanced training school.

You would then join the project team environment of our Customer Service Division where you would have a wide variety of challenges and be stimulated by the cross-fertilisation of ideas. Salary would be around R14,000.

Prospects? All of these positions offer considerable scope for personal career progression. Indeed it is our policy to develop and utilise fully the potential of our staff. Consider our growth, the excellence of our training, our policy of promotion from within, the wide experience you will gain it would be entirely up to you, your abilities and your ambition.

After generous relocation allowances, our attractive packages will ensure you enjoy a high standard of living - the local spending power of the Rand is about the same as that of the Pound in Britain. Our fringe benefits are excellent, including pension & medical schemes, car allowances and generous leave allocations.

So why spend another winter in the cold? To apply please write to: Patricia Aldridge, ICL, Bridge House North, Putney Bridge, London SW6 3JX with full details of your experience, quoting reference CW1303. Or phone her on 01-788 7272 ext 2047. Interviews will be held in London.

International Computers

think computers - think ICL



You & The New Big Name In Computers

HOME COUNTIES

SALARY £6-£8,500

When we refer to The New Big Name In Computers we are referring to an organisation with enormous resources, foresight, and inner strength, who produce a sophisticated range of powerful mini computer systems. Their current market status is a direct reflection of dedicated professional co-ordination and talent.

POINTS OF INTEREST

It is worth noting that in areas of production from Software Development to Commercial Applications this company offers more computer power per individual (INSTANT MACHINE ACCESS) than most others. They work in small teams ensuring a visible end product, a must for job satisfaction. The word "excuse" is practically eliminated within their set-up and rest assured there is always new and interesting development taking place.

WHERE DO YOU FIT IN

Fortunately this is a young and thriving company with a great deal to offer, whatever your status, a genuine career opportunity is open to those now involved in either of the following areas:

1) Basic Software Development

2) Commercial Applications (Programmer / Analysts or Analysts with Cobol)

For further details please contact Eddie Howard.

REAL-TIME PROGRAMMERS

UK & OVERSEAS £ DEPENDENT ON LOCATION

Take advantage of our position as one of the leading recruitment specialists in the field of scientific programming. Today, more than ever, there is a demand for highly skilled personnel with the ability to tackle wide ranging projects in the design and development of scientific computer systems. If you hold a degree in a scientific discipline or have relevant practical experience of real-time mini-computer systems, using either ASSEMBLER, BASIC, MACRO II, CORAL or FORTRAN, then give us a ring quoting ref. CW235.

TECHNICAL SUPPORT PROGRAMMERS

LONDON AND THE SOUTH

£6-£7,500+

You will play a very important front line role assisting the sales team of a large international organisation. Responsibilities and duties will necessitate working on client premises periodically, escorting and compiling technical specifications which will assist the sales force to successfully accomplish their tasks. Applicants must possess a good commercial O.P. background along with a pleasing and helpful attitude. For further details please quote CW236.

Edmund Howard & Partners

5 BRIGHTON ROAD, BURBITON, SURREY, ENGLAND. TEL: 01-399 5183

Computer Personnel Consultants

Analyst/Programmers To £5,454

We are an independent Mail Order Company based in Bradford, West Yorkshire. We have an expanding Systems and Programming Department, housed in modern offices, and we require additional staff to strengthen teams working in the following areas:

IBM/DEC

We are shortly going live on a pilot Agency Accounting system which links distributed PDP 11/34 minis to our IBM 370/138. We need additional staff in both IBM and DEC teams to support the initial system and help in the next stage of development.

To join the IBM team you should have ASSEMBLER experience, ideally using DOS/VS. We also use COBOL so knowledge of this would be an advantage.

To work on DEC systems a commercial programming background on any hardware is required. We will train you to use our software environment, based on the RSX 11M operating system.

ICL

You will undertake support work on existing systems which were developed for 1900 series machines and are at present being transferred to our new twin 2960's under DME.

You should have at least 1 year's PLAN experience and COBOL would be an advantage as we will be developing new systems using this language to run under the VME Operating System.

We Offer

A negotiable salary up to £5,454 • Potential for promotion to senior scales rising to £6,943
Paid overtime • Flexitime • Staff discount on all catalogue goods
• Relocation expenses

To Apply

Phone John Rhodes (ICL) or Howard Midgley (IBM) on Freephone 5092 (dial operator, ask for the number)
or write to: Mrs. C. A. Davis, FREEPOST, Grattan, Bradford

Grattan

Apply to A-514

THERE ARE ABOUT 20 SOFTWARE PEOPLE IN THIS COUNTRY WE WANT TO SPEAK TO.

ARE YOU ONE OF THEM?

The Company

We're one of the world's foremost mini-computer companies... each year announcing new highs in sales, earnings, computers sold, facilities occupied and people employed.

A major reason for our success has been the design of compatible hardware products that can be interchanged and function together as integrated systems backed by software that will function with almost any of our systems.

We plough back a significant amount of sales revenue into research and development... in fact we have one of the highest ratios in the industry.

The chart gives an indication of our growth and strength.

The Position

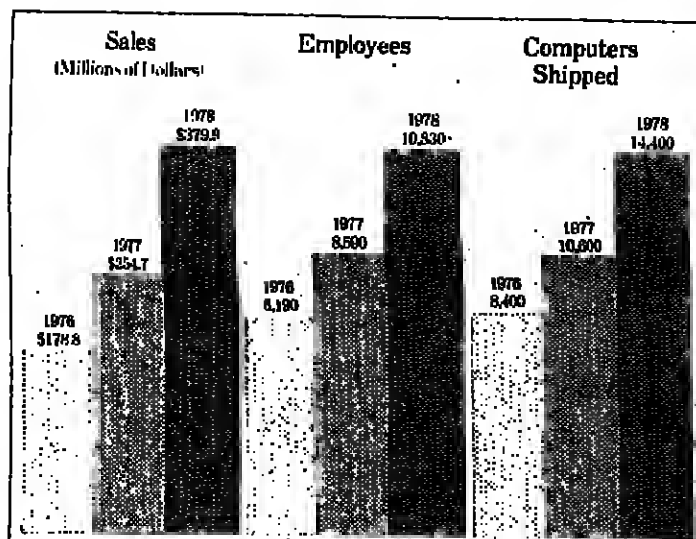
Right now we're looking for a Software Development Manager capable of generating the same growth for our new Software Development Group. It will be one of the tasks of the successful candidate to determine the most appropriate location for the most satisfactory operation of the Group.

The creation of the new Group emphasises the importance we place on software as a means of growth and of ensuring continued customer acceptance of our products.

You'll be expected to set up a highly professional team from scratch. Its major function will be the development of operating systems, compilers, communications, languages and application programs. We expect you to spend time in the U.S.A. to work in close co-operation with our American operation during the development of the new Group.

The Opportunity

It is our intention that the new Group grows quickly but purposefully. You can expect excellent support from all levels. The corporation has more than doubled its expenditure on software development during the past few years and this trend will continue. This is an outstanding opportunity for a self-motivated professional man or woman, educated to degree level with at least 7/10 years experience in systems software development with a major computer manufacturer — preferably mini's — in managerial and other capacities. Alternatively you should have a minimum of 5 years experience successfully managing software development teams in a software house.



Letters of application should be sent to:
David Daley, Personnel Manager, Data General Ltd.,
3rd & 4th Floors, Hounslow House, 724-734 London Road,
Hounslow, Middlesex TW3 1PD.

Data General

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You must know what they make —
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Telephone: 061-236 9085

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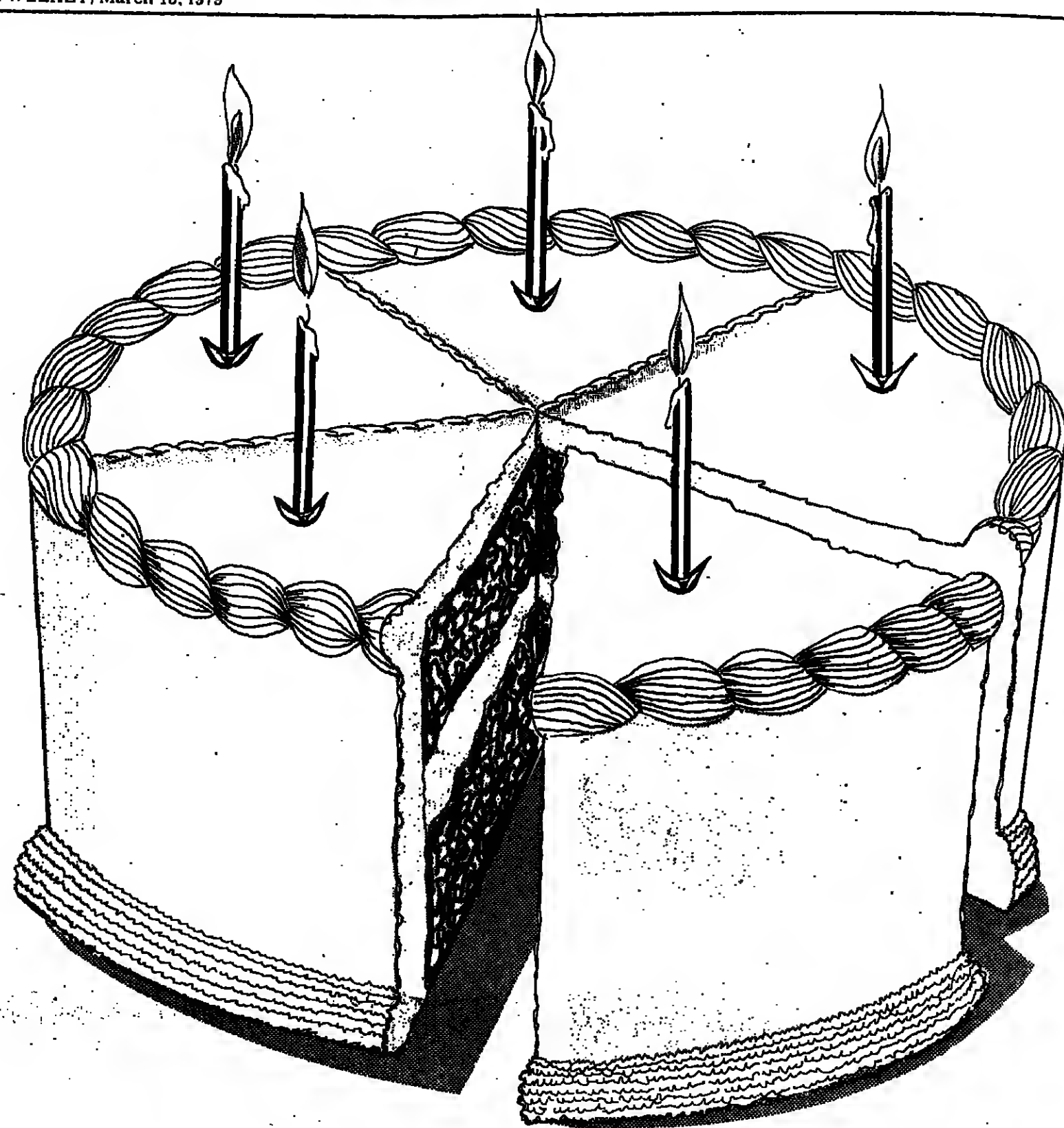


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It's a cut above the average career opportunity.

That's five years of solid innovation in systems and software which will really give you something to get your teeth into. Year one, 1979, will see the implementation of interactive programming facilities, plus a comprehensive training package using audio-visual equipment. Plus a further four years of things you'd like to be working on, including on-line applications for our unit trust and insurance departments.

Save & Prosper is the largest trust and equity linked life assurance group in the UK. We also market a wide range of other financial products like annuities, pension schemes, school fees and life assurance policies.

Getting to the forefront of our business has already meant building a pretty sophisticated computer environment. Our IBM 370/148 operates under DOS/VS, GRASP/VS and CICS/VS using remote and local 3270 VDU's, 3340 disks drives and 3240 tape units. We have 28 software packages installed, plus in-house written software.

So you can see that we drive our development projects through to completion. Multi discipline project teams are essential part of this attitude, and we need these people to join those teams now:

SYSTEMS PROGRAMMERS c. £6,000
You must either have a minimum of 2 years' Systems Programming experience in DOS/VS environment, and have successfully completed at least one DOS/VS system generation, or a minimum of two years CICS

experienced including some knowledge of CICS generation.

ANALYST/PROGRAMMER c. £5,500

With a minimum of three years' programming experience in either COBOL or ASSEMBLER plus some experience in analysis.

SENIOR PROGRAMMER c. £5,000

You should have at least four years' experience in COBOL and ASSEMBLER.

PROGRAMMER c. £4,500

With a minimum of two years' experience in either COBOL or ASSEMBLER.

The 'fringe' benefits include non-contributory pension and life assurance, BUPA, company assisted savings plans, luncheon vouchers, paid overtime and flexible working hours.

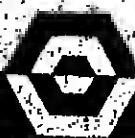
Altogether, a very nice package. But remember that we're an ambitious company. We want ambitious people, specialists with real skill and genuine ability; who can take full advantage of our planned, progressive career structuring.

We want people who are a little bit out of the ordinary. A cut above the rest. After five years development with us, you'll have plenty to celebrate.

Why not telephone (01) 554 8899 and have a chat with John Parodi, Mick Chivers, Tony Ward or Des Cunnane.

Or write to Matthew Dickinson, Save & Prosper Group Limited, Arodene House, Perth Road, Gants Hill, Ilford, Essex.

SAVE & PROSPER GROUP



FACILITIES MANAGEMENT BUSINESS SYSTEMS CONTRACT STAFF SUPPORT RECRUITMENT CONSULTANCY
SOFTWARE PACKAGES COMPUTER SECURITY FACILITIES MANAGEMENT
CONTRACT STAFF SUPPORT RECRUITMENT CONSULTANCY BUSINESS SYSTEMS SOFTWARE PACKAGES



HEXAGON offers minimum £5000 reward for Contract Systems Analysts who are earning £8000 and wish to earn £250 to £300 per week.

CONTRACT DIVISION

SYSTEMS ANALYSTS

Payroll package specialist — East Midlands — 3-6 month contracts.

Two Senior (mini) Systems Analysts — Surrey — for min. 1 year contracts.

Systems Analysts — City and South London — to work on sales and nominal ledger applications — 6 months to 1 year contract.

Senior Analysts — Berkshire — for on-line material control and order processing — 6 months to two years.

City Analysts with strong banking experience, clearing or merchant experience for data base and on-line work.

PROGRAMMING

A CCP/RPG2 Project Leader for long term City contract to **£300 p.w.**

Merk IV Specialist — for Central London — **£250 p.w.**

DOS, CICS Systems Programmer — Hertfordshire — to **£350 p.w.**

Dozens of other immediate contracts for

MACRO 11 — Kent
OS COBOL — Herts
DOS COBOL — West End
and Surrey
UNIVAC, COBOL — Essex
BAL — City

OPERATIONS

George 2 Operators for indefinite contract — Herts — **£130 p.w.**

Burroughs B/3700 Operators for 12 months — City — **£135 p.w.**

IBM OS JCL Writers — **£140 p.w.**

Peripheral/Terminal Operators — **£100 p.w. +**

PERMANENT RECRUITMENT DIVISION

PROJECT LEADERS SYSTEMS ANALYSTS ANALYST PROGRAMMERS PROGRAMMERS

It doesn't matter who you are or how much experience you have got if you want to move, promote yourself or perhaps it's time for a change.

Hexagon's permanent recruitment division can help. Here is just a small selection of our current client requirements.

LONDON

Project Leaders £ Your asking price
COBOL Programmers, banking to **£7,000 + travel**

PL1 Programmers c. **£6,000**

Systems Programmers from **£7,000**

Assembler Programmers to **£6,600**

Systems Analysts c. **£7,700**

HOME COUNTIES

Project Leaders to **£8,300**
Analyst/Programmers/RPG2 to **£7,000**
COBOL Programmers to **£7,000**
Analyst Programmers, Assembler to **£6,000**
Systems Analysts to **£7,800**
BAL Programmers to **£8,000**
PL1 Programmers to **£6,500**

WEST COUNTRY

Project Leaders c. **£7,000**
Systems Analysts, Assembler c. **£7,000**
COBOL Programmers to **£6,850**
Assembler Programmers to **£5,500**
Analyst Programmers to **£7,000**

PERMANENT OPERATIONS

Programmers IBM Operators
DOS/VS Senior Operators — Croydon — **£5,300**
DOS/VS Operators — City — **£4,400**
OS/VS JCL Writers — Bedfordshire — **£5,500**
OS/VS2 JCL Writers — Middlesex — **£6,200**
OS Deputy Shift Leader — London — **£5,800**
DOS/VS Chief Operator — Essex — **£6,000**

ICL Operators, GEORGE 2 and GEORGE 2+ — Herts, City and North London — **£5,500 p.a.**

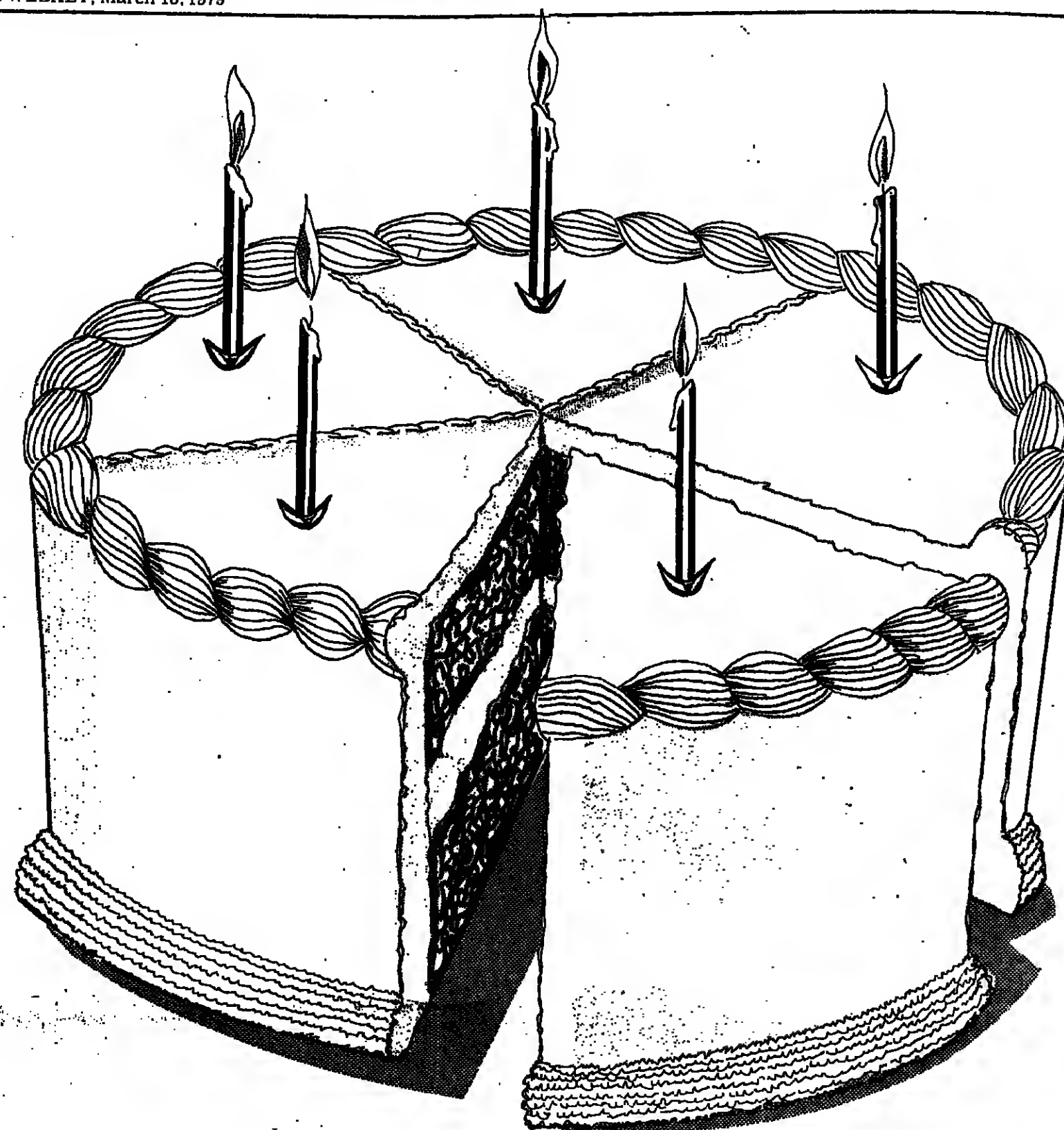
Honeywell 66 G COS Operators — North London — Minimum 1 year's experience — **£4,000 p.a.**

Work in beautiful Wiltshire and earn up to **£4,500** as a Honeywell Operator with just 18 months' experience.

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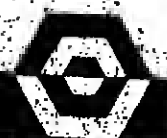
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Honeywell 66-80 COS Operators — North London — Minimum 1 year's experience — **£4,000 p.a.**

Work in beautiful Wiltshire and earn up to **£4,500** as a Honeywell Operator with just 18 months' experience.

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SYSTEM BACKGROUND

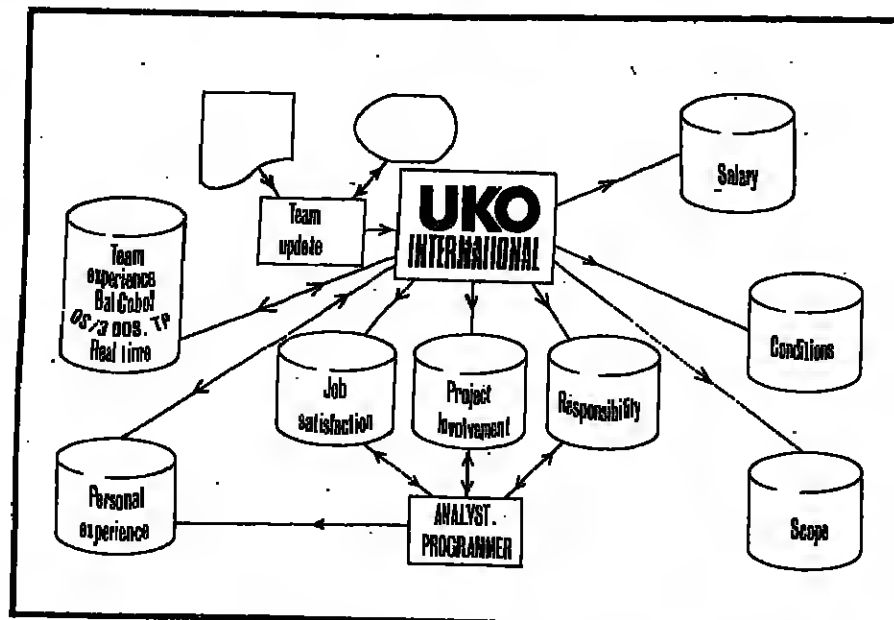
United Kingdom Optical is the country's largest manufacturer and distributor of lenses and frames in the British optical market. The Company also has interests overseas and enjoys a flourishing export trade. Since 1976 when the Group obtained a Univac series 90, a sophisticated real time order processing system has been developed and implemented. We are now seeking to expand our computer team before embarking on the Company's next phase of computer development.

INPUT PREPARATION

We require analyst/programmers and experienced assembler programmers who feel they are ready to increase their areas of responsibility. We need people with a high level of self-motivation coupled with a desire and ability to become involved in all areas of system design and implementation.

SYSTEM BENEFITS

You will find yourself working for a Company dedicated to the continued expansion of its computer usage. Salaries are competitive and working conditions, which include



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If you feel your career is ready for some updates, and you have something to offer, then contact me at home or office and see what we can offer in return. Alternatively, write to me giving a brief outline of your career to date.

Contact: Brian Jones, Esq.
Systems and Programming Manager

U.K. OPTICAL CO. LTD.

Bittacy Hill
Mill Hill, London, NW7
Daytime: 01-346 2660

Evening:
Welwyn Garden City
26422



CITY OF GLASGOW DISTRICT COUNCIL CONTROLLER OF COMPUTER MANAGEMENT SERVICES

Salary Scale: £10,650-£11,378

The City of Glasgow District Council is one of the largest local authorities in Scotland with annual expenditure of £200 million. At present it does not have major computer facilities of its own but extensively utilises, on an agency basis, the services of Strathclyde Regional Council and the large Honeywell Level 66/40 Computer.

A substantial extension of the Council's use of computers is planned and the decision has been taken to establish a computer services department with an associated budget in the region of £750,000-£900,000. A comprehensive systems development programme is being formulated and the successful applicant will be a principal participant. The new developments will make full use of interactive processing and database techniques using remote terminals located in major user departments.

The controller of computer services will report to the Director of Finance and will be responsible for all data processing activities within the district council. The successful applicant, ideally with a good degree or professional qualification, will have had considerable experience in data processing at a senior managerial level. Previous experience of database techniques, telecommunications, mini-computers and local government systems would be valuable.

Superannuation and life assurance schemes in operation, generous holidays, relocation assistance (where appropriate) available.

Please telephone 041-221 9600 extension 2042, for an application form which must be returned not later than 28th March, 1979, to the Director of Finance, City Chambers, Glasgow G2 1DU.

Please quote Ref. CW/11/79

PROGRAMMERS FOR ADVERTISING

WEST END OFFICE £ NEG SALARY

If you work in town and you are looking for a change, then consider the following:

- ★ DEC and IBM hardware
- ★ Training in RMS
- ★ On-line Systems for the Advertising Industry
- ★ Rapidly expanding subsidiary of public company
- ★ Salary package in line with experience and potential

The heavy schedule of development projects will enhance your BASIC programming skills whilst gaining highly marketable applications experience.

Phone me, GEOFF MARSH, on 01-499 4501 to arrange an early meeting.

MAIDENHEAD

PROGRAMMERS

£ NEG
+ BENEFITS

JOIN IN THE SUCCESS OF TURNKEY SYSTEMS

Having been around for 13 years already puts my client on a very sound footing. Currently they are developing turnkey systems in the Production/Stock Control and Order Processing areas. All of these systems are on-line and use mini computer hardware (micros under investigation). Working in small project teams, you will be involved in projects right through to implementation at the customer site. Progression to Analysis and Project Leading posts is dependent only on your abilities. So if you are ready for a move, or want to work nearer home, bring your COBOL experience to me, GEOFF MARSH, on 01-499 4501 NOW.

WARRINGTON
European Data Centre — Large SNA Network

PROGRAMMER

to £5,500 p.a.

SYSTEMS PROGRAMMER £7,500

for

303X and SNA

MOVE UP TO TELEPROCESSING

An additional COBOL Programmer is sought to join a small team embarking on major on-line development project using CICS. In addition to learning CICS there will be opportunities to be involved with a sophisticated international network using database and SNA software. If you are determined to learn advanced IBM techniques and you are a competent COBOL programmer, call GEOFF MARSH on 01-499 4501.

1st Multidrop SDLC network in Europe

Very few companies will be using 303X and SNA in 1979. Consequently, here is a golden opportunity to add these skills to your existing VS1 'know-how'. The current installation is a 2 Mb 148 under VS1 with a European CICS network of c 85 VDU's with 3790's and 3705 controllers. It is designated by IBM as a 'Leading edge' account, i.e. at the forefront of technology.

With the arrival of the 3031 the company is planning expansion into major database software, distributed processing and direct links to the U.S.A. It is also considering MVS. Your career progression is limited only by your own potential.

CALL GEOFF MARSH on 01-499 4501.

ANALYST PROGRAMMER

£6,500

Some European travel for a Senior Programmer

Wishing to move into Analysis

The task is to design and implement major additions to Order Processing Inventory Control and Accounting Systems for the French subsidiary. All the systems are on-line and written in COBOL. Here is an excellent opportunity to gain analysis experience over a wide range of CICS applications areas.

Call GEOFF MARSH on 01-499 4501.

Our client is a \$ multi-million Corporation, whose European Data Centre is situated overlooking a golf course in a Science Park setting. The site is easily accessible by major roads and office accommodation is

to the highest of modern standards. The management is young and go-ahead, and able to reward company employees through very attractive, above market salary scales.

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STRAIGHT IRONWARE

LONDON and THE SOUTH EAST
QUOTA £14,000 and COMPANY CAR
WITH NO CEILING ON COMMISSION

TO SELL AN EXCELLENT RANGE OF V.D.U. AND
TELEPRINTER TERMINALS COMPATIBLE WITH MOST
MAIN FRAMES, VERY COMPETITIVELY PRICED
AND READILY AVAILABLE

Our Clients are one of the leading manufacturers of computer peripheral equipment in the world. Their excellent range includes highly competitive VDU and teleprinter equipment which sells very well because of their PRICE, RELIABILITY and AVAILABILITY. These fast moving products are sold both to the end user and OEM markets and require little or no systems involvement.

If you are an established "straight ironware" salesman and identify with the sort of products sold by companies such as ITT, MEMOREX, OLIVETTI, KODE, CASE, CREED, HARRIS, etc., then we have something very interesting to discuss. If you do not have this experience but feel your background equips you to sell successfully in this fast moving market place then we would still be keen to meet you!

TELEPHONE BOB BOWER A.S.A.P. TO ARRANGE A MEETING. DO IT SOON, YOU HAVE NOTHING TO LOSE AND A GREAT DEAL TO GAIN!

Reference CW 339/1

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HR

TELEPHONE: 01-353 7141 (24 HOURS)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

SALES MANAGEMENT

MIDLANDS

LONDON

COMMUNICATIONS AND DISTRIBUTED PROCESSING

CIRCA £17,000 p.a.

Two vital appointments are to be made within the next four weeks. Both at Branch Sales Management level, these positions have resulted from expansion and a redefining of market areas, product areas, and general sales strategy.

Our clients enjoy an excellent reputation in the fields of communications and distributed data processing and can offer a rewarding career with clearly defined promotion prospects.

Current Sales Managers or Senior Sales Executives aspiring to management are encouraged to apply. An intimate knowledge of the Computer Industry and particularly the areas already described are of paramount importance.

WE ARE WORKING TO A TIGHT DEADLINE SO INTERESTED CANDIDATES SHOULD TELEPHONE THE ADVISING DIRECTOR, BOB BOWER, AS SOON AS POSSIBLE.

Reference CW 339/2

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HR

TELEPHONE: 01-353 7141 (24 HOURS)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

SYSTEMS ANALYST up to £6500 p.a.

A systems analyst is required by Barclays Unicorn Group Limited, a leading Unit Trust and Life Assurance Company, at their East London Head Office.

The position requires a person with the ability to motivate others. The analyst will be responsible for the development of commercial systems to support the expansion of the Life Assurance side of the Group's operations. He/She will be seeking to enlarge his/her experience in a financial environment and to be in a position where practical ideas can be put to good use.

We use an ICL 1904A under George III while a changeover to a 2900 system is being considered. We are planning to install a large mini-computer later this year.

The successful applicant will need sound systems experience and will probably have gained this in a commercial background. Knowledge of ICL 1900 Disc and Cobol and/or Life Assurance systems will be advantageous.

The salary range is £5000-£6500 p.a., plus productivity bonus. As a Barclays Bank employee, the conditions of employment and fringe benefits are substantial and include a non-contributory pension scheme, staff restaurant and luncheon vouchers, 5 weeks' holiday, a profit-sharing scheme and also a special house-purchase scheme.

Applications should be made in writing to:

**Staff Department,
Barclays Bank Trust Company,
Juxon House, 94 St. Paul's Churchyard, London EC4N 8EH.**

BARCLAYS

city of
canterbury

Systems Analyst/ Programmer

Salary £3,732-£5,073 (inclusive)

Applications are invited for the above position at the Council's purpose-built computer centre on the outskirts of Canterbury. The Council have an ICL 2803 computer which is linked to the main Council Offices for on-line VDU enquiries. Further on-line systems are planned and the person appointed will become involved in this area (with training given where necessary).

A sound knowledge of COBOL using Direct Access techniques is essential and experience in NICOL and ICL software utilities would be an advantage. Commencing salary related to experience.

Consideration will be given to housing accommodation and a generous disturbance allowance scheme is in operation. Closing date 27th March 1979. Interview date 5th April 1979.

Application forms may be obtained from the Personnel Officer, 3 Martowe Avenue, Canterbury, Kent CT1 2DN. Telephone: Canterbury 51755, ext. 12.

Exciting New Microprocessor Development Programmers

North London

To £6500

Our client, part of a large multi-national group is currently developing a new range of highly sophisticated communications equipment.

The equipment is built around a new central communications processor and uses microprocessors as control units for the peripherals.

They now need Programmers to participate in the detailed design and development of the new operating system and its applications software. Successful candidates can expect to be closely involved with users, hardware engineers and OEM suppliers in developing this exciting new project.

Suitable candidates will possess in excess of 18 months experience working on projects such as air traffic control, flight simulation, weapons guidance or specialist software development. Experience in working in a small project team environment is desirable. Essential is solid programming experience in one of the following languages: Assembler, CORAL, ALGOL, PASCAL or FORTRAN.

Ideally, candidates will be aged 22-26 with a degree in engineering, science or mathematics and have the presence and ability to liaise with the various interface points in the project team.

The company offers a good range of benefits which includes full relocation and temporary accommodation if necessary.

To discuss these exciting new opportunities further contact Morley Holliday or write in strictest confidence quoting reference MGH 2126.



**Lloyd Chapman
Associates**

123, New Bond Street London W1Y 0HR 01-408 1670

Programmer

N. London, to £6,000

This major international manufacturing company intends expanding the DP facilities at its North London Head Office and is currently evaluating new equipment to replace the heavily overloaded IBM 370/115. TP and distributed processing feature prominently in the plans. In anticipation of these developments a new position has been created for which we require a

young enthusiastic programmer ideally with two or more years COBOL experience. The successful candidate will immediately become involved in the redevelopment of existing applications designed to achieve a fully integrated system. Career prospects are excellent with this progressive organisation and there is an attractive range of fringe benefits.

E. Sutton, Ref: 17057/CW

Male or female candidates should telephone in confidence for a Personal History Form to: LONDON: 01-734 6852, Sutherland House, 5/6 Argyll Street, W1E 6EZ.

Hoggett Bowers
Executive Selection Consultants
BIRMINGHAM, CARDIFF, GLASGOW, LEEDS, LONDON, MANCHESTER, NEWCASTLE and SHEFFIELD.

SYSTEMS ANALYSTS AND ANALYST/PROGRAMMERS GREECE

KHYKY is the Central Computing Centre for all Welfare and Health Services in Greece.

A. System Analysts

KHYKY seeks graduates with a minimum of 4 years' experience in the design and implementation of commercial or administrative computer applications for immediate employment as System Analysts to be involved in a variety of projects.

Post graduate studies in computer-related subjects will be a definite advantage.

The form and terms of employment will be commensurate to the applicant's experience and qualifications. For details write to:

**KHYKY
Computer Centre of Social Services
101 Syngrou Avenue, Athens, Greece
or ring ATHENS 9227.098**

Applications should be submitted by the 15th of March, 1979. Applications received after that date will be considered in relation to future needs of KHYKY.

B. Analyst/Programmers

KHYKY seeks graduates with qualifications in System Analysis and Programming to fill 4 established positions in the specialization of Analyst/Programmers.

Selection will be by examination. Applications and enquiries should be made to the same address as above. Applications should be submitted by the 30th of March, 1979.

BOLSOVER DISTRICT COUNCIL

FINANCE DEPARTMENT SENIOR SYSTEMS ANALYST/ PROGRAMMER

(Based at Mansfield)

Grade APS Salary £4,773 to £5,073 (inc. supplement)

The Authority will be installing a Nixdorf 9970/6 computer in August 1979 to replace its existing computer. When the present conversion of systems is completed, an extensive programme of development of on-line systems is planned.

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THE SALES AND MARKETING BIT

A vital source of information

ONE often hears the cry "Everybody sells," and I am sure that is a slogan we all applaud. Yet one seldom comes across a corresponding enthusiasm for everyone to produce call reports.

Call reports are essential documents for instigating actions and recording history. Time after time the existence of a call report proves to be the only source of information concerning what was agreed or said at some meeting that took place in the dim and distant past. Sometimes the only way the marketing department is made aware of an aspect of competitive activity is by a circulated call report.

In this column we recently discussed the importance of producing a call report no later than immediately after the call. Let us now look at the call reporting process in terms of its broad application.

A call report should be produced for every face-to-face contact with a client, irrespective of the venue. Telephone contacts should also be reported in the same manner whenever a significant topic has been discussed.

Call reports are essential wherever agreement to take action of any kind has been made, and especially if such commitment affects other people in addition to the generator of the report.

It is essential that everyone within a sales and marketing environment realises the importance of the call report is not limited to the salesman's domain.

Of course, if these disciplines are to be followed a call reporting system needs to be simple.

One of the questions within the structured interviewing system my com-

pany's recruitment division uses for evaluating salesmen, is one which asks the candidates to identify his greatest weakness in the context of selling skills. Invariably the answer is related to an abhorrence of paperwork. It is, therefore, unfortunate that many companies operate a call reporting system which gives the impression of an entrance examination for Mensa.

Some sales organisations in their megalomaniac quest for information create sales data collection systems which have the unfortunate knack of creating the very opposite effect to the one intended.

From the salesman's point of view, a call reporting system must provide the maximum effect with the minimum of effort, whether the outcome be action or merely imparting information. If much of this can be done by merely ticking boxes (type of call, products discussed, copy to, etc.), so much the better.

As far as the recipients are concerned (the sales manager, technical director, or whoever), the principal information needed is date, name of company, contact, a brief statement of the key elements of the call, action to be taken, name of the salesman. Any further detail should be produced only by way of formal request from those with a special interest.

The call report is an excellent device for keeping people up-to-date with client situations. If a salesman, by way of a tick, or stating initials, can ensure that all interested parties receive a copy of his report, the ensuing benefits substantially outweigh any risks of a paper flood.

TRADER

BOOK REVIEW

Management methodology for software product engineering, by Richard Gunther, 379 pages. Wiley-Interscience.

THIS book seems especially suited as a textbook for managers, working in software houses, service bureaux, and computer suppliers. It can usefully serve as a checklist for anybody who is concerned with the construction or maintenance of a product development methodology. It would be a bible for the software product manager who is saddled with the responsibility for getting the product out, but who has no company standards upon which to base his work. Finally, it would be a useful source of ideas for software products with less stringent requirements than Gunther presupposes. It is well illustrated, and well organised. The author is practical in his approach. There is no blag of the academic side of the software engineering, computer science crowd. This reviewer's heart was warmed by the clear and consistent use of an explicitly recognised management process. Objectives approach on page 47, which is followed up in stating product and goals such as reliability, maintainability, and quality of human interface ("usability"). This essential element seems to be missing from most development methods I have seen, and is so scarce that TRV Systems is the only really good exception. In the interests of readers who might consider adapting the method for their own use, I would like to mention the following improvements: measurable quality objectives, deeper design inspection methodology and the use of automated aids in this process. All these things could enhance Gunther's methods. TOM GILL

Puzzle Answer

TAKE the cube with two adjacent blue faces, and place it on the left so that the blue faces top and front with red underneath. Then put the cube with two adjacent green faces next to it so that green is concealed from view at base and rear. Next in line comes the cube with just two adjacent red faces, placed green top, red front, yellow base and blue rear. Lastly we have yellow top, green front, blue base and red rear.

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Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth
Block 30 (Building Blocks)

Cleo has accidentally stumbled on the Future System in its huge underground cavern beneath the Sierra Nueva. Hex has been sent there deliberately by the DPM — who has forced him to rethink his ideas on his own ancestry. His task is to bring the Future System live ahead of schedule, now that the System is in the throes of a gigantic epidemic.

NEDDY the Sasquatch, Piltown's clone, conducted Cleo around the plant, describing each new wonder to her in Esperanto. She paid little attention. Rose's diagnosis of pregnancy had shaken her. He might be wrong; but he had nothing to gain by making it up, since it spoils his plans for her. She cast her mind back on Hex and on the single night of passion in the Inter-Block Gap which had landed her in this predicament — and, she realised, effectively ruined their friendship. While it remained platonic their relationship had been harmonious: so soon as a physical aspect crept in it had deteriorated.

Perhaps it was too much to expect an android and a human to get on in that sense; but at the time he had seemed very special — an android who had not forsaken his humanity. Then she had believed him capable of leading them into a brave new world. Now the romantic mist had dispersed and she saw him for what he was, an out-and-out opportunist.

She was a little disappointed with Nedly too. He seemed to have less of Piltown's spark of humour, and none of his defiance. Whereas Piltown had broken loose to roam the world, Nedly had stayed to assist his Frankenstein-creator. Although they were identical twins, they clearly differed in temperament.

When she returned to Rose's lab she was none the wiser. Rose was again at his workbench, hunched over a microscope. He looked up as they came in.

"So you've finished your semiconducting tour," he observed wryly.

"Yes, thank you."

"Nedly pointed out all the highlights, did he?"

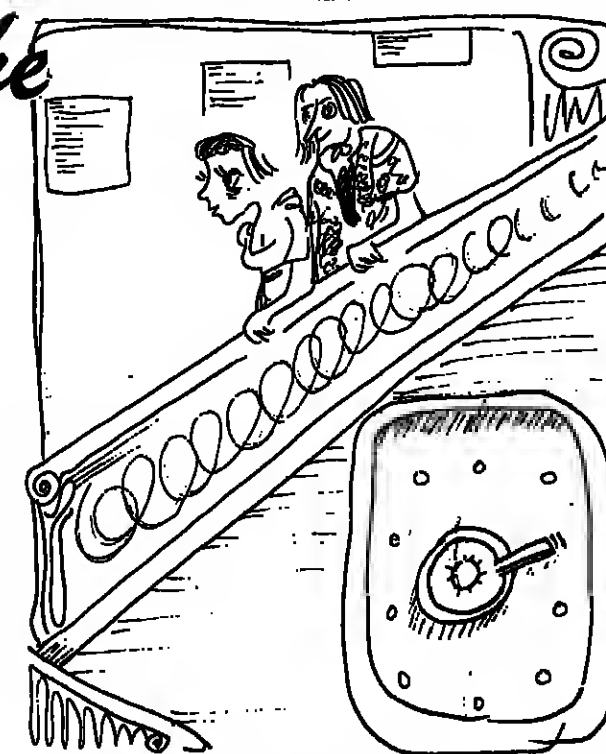
"Yes. But I didn't understand a word."

"All Greek to you, I suppose."

"Greek I can manage," she replied. "Esperanto's the language barrier."

"Hm. Well, you can't stay."

"Can I go back to the surface?"



"No. You will have to be disposed of."

There was a pause. Cleo waited for him to spell it out.

"I'm handing you over to my superiors," he concluded at length.

"I thought you were in charge."

"Here, yes. But you're not wanted here. I'm packing you off to Fort Rnsford. Come this way. There's a subway link."

He led them out again. They threaded their way among the bustling automate down several flights of stairs. They came to a massive steel bulkhead which swung open noiselessly on its approach. Passing through, they entered the terminus station.

"This is our link with the outside world," said Rose.

"We're in luck: there's a train coming. Nedly will accompany you on the journey. Then the DPM can decide your fate."

He spoke a few sentences in Esperanto to the apeman. Then the railcar arrived. McNull stepped out, followed by Hex.

"Who are you?" demanded Rose.

Hex and Cleo gaped at each other open-mouthed.

"I said: who are you?" repeated Rose.

McNull answered first. "I came to pass in the last days of the System that a great pestilence raged over the land. And

In those days travelled the chosen android and his disciple, from the heart of the Old System unto the birthplace of the new.

"We've been sent by the DPM," interrupted Hex, emerging from his trance. "I am the Hexadecimal Kid and this is the Wizard of Os. We're software consultants. We've come to help you get this thing off the ground."

Rose's eyes narrowed. "Where are your credentials?"

"We haven't any. There wasn't time," explained Hex.

"The System is going gligotic."

"What? I've heard nothing of this."

"All data communication has been cut in an attempt to stop it spreading," Hex replied. "We must get the Future System running before it's too late. Lead us to the command console; there's no time to lose."

Rose laughed. "I like it: two jokers calling themselves consultants turn up with some half-baked story and not an ID-card between them demanding to go straight to Mission Control. I have to admire your effrontery."

Hex saw they were getting nowhere. As a last resort he tried the cryptic pass-phrase which the DPM had instructed them to use: "Two years' Cobol experience."

Rose's expression changed. "Now that's quite another matter," he said deferentially. "Why didn't you say so in the first place? Come with me and I'll show you what to do."

When they were all back in his lab he asked Hex, "How much do you know about the project?"

Only that the Future System is called BOSS, for Bionic Operating System Supervisor.

"I'd better begin at the beginning," responded Rose.

"Originally I was a neurophysiologist, but I got bored with cutting brains out of monkeys. I wanted something more creative."

"Such as putting brains into monkeys," Cleo suggested, glancing at Nedly.

"Exactly. I started messing about with electronics. But you'll notice that Nedly is not an ordinary android: he has no electronic parts. You see, I grew convinced that silicon chip technology had neared its limits. I sought a purely biochemical alternative. There's more organising ability in one protein molecule than in a whole slab of silicon. I turned from microprocessors to micro-organisms. In short, I began to dream of the self-reproducing computer."

"So when the System was recruiting for the Advanced Systems Group they selected me. I joined, and eventually became director. Now I am the only one left, apart from robotic functionaries. The development phase is being wound down; it has almost reached its conclusion. We have made the ultimate biotechnical breakthrough."

He turned round and picked up a flask of clear fluid.

"Look," he declaimed, "a programmable virus! There's enough information in its DNA to turn an elephant into an IBM 360."

"Not the other way around?" queried Cleo innocently.

What witch's brew has he concocted? Next week the cauldron boils over.

1979 Richard Forsyth, Har

BOOK REVIEWS

Even minimisation is kept well in view!

Digital circuits — a preparation for microprocessors, by Charles McKay. Prentice Hall International, 68 Wood Lane End, Hemel Hempstead, HP2 4RG. 385 pp. ARG. 386 p. £13.10.

THIS is a beautifully presented textbook which could be used either as the basis for a university or polytechnic course, or for self-education. Each section includes question-and-answer material so that the book can be regarded as a programmed-instruction text.

In some ways the book goes deeper into computer architecture than the average computer scientist needs. Today, particularly in the UK, the number of computer professionals who will actually design a CPU is very small, probably smaller than it was some years ago, ironically enough as a consequence of the microprocessors mentioned in the title.

So to some extent it is of academic interest to see just how an accumulator is constructed from logic elements, and the logic elements from electronic ones. However, the understanding provided by the book will help those who, while not in the business of designing integrated circuits, are very much in the business of joining them together into systems. And this is a booming area, even in the UK.

Those who previously were software specialists are now, if they are sensible, re-educating themselves in hardware, because it is cheaper nowadays to solve problems by adding cheap hardware than expensive software.

I was hoping to find something to quarrel with in the book, and eagerly turned to the passages on minimisation, which traditionally have been concerned with techniques for cutting down the number of gates to realise a given function. This is now old-fashioned, since it is cheaper to provide extra gates than extra connections. But I was disappointed, the concept of cost minimisation is kept well in view.

Recommended for electronic engineers — and for those of us who feel that one day we really ought to get down and understand the machines we make our living out of.

D. J. P. A. RACE, Brunel University

Tilting at compiler design windmills

Principles of compiler design, by A. V. Aho and J. D. Ullman. Addison Wesley Publishing Co Inc, 11 Hills Place, London, W1. Tel: 01-734 8817. 215.20.

WHAT may first attract you to this book is the coloured picture on the cover. The eye is immediately caught by a giant fire-breathing green dragon (labelled "complexity of compiler design").

Also depicted is a knight in shining armor (labeled "syntax directed translation"). He is riding his trusty steed (labeled "data flow analysis") and with his "LALR parser generator" lance held high he is ready to do battle with the monster.

After talking in the context of this book, and closing the book cover, the picture has changed to Don Quixote on Rozinante and (looking through Sancho Panza's eyes) we see that there was no dragon, he was only tilting at windmills after all.

The authors are trying to suggest that while the task of writing a compiler for a general purpose language is not trivial, it is in fact less difficult than is generally thought.

Their book is certainly easier to read than Gries', against which it will no doubt be a major competitor. Like Gries, the authors write their book on their local computer and it was merely reproduced by the publishing company. However, since Aho and Ullman are a photographer and an excellent software



Dr Race

the machines we make our living out of.

D. J. P. A. RACE, Brunel University

Appeal to DP science students

Structured programming and problem solving with Pascal, by Richard Kiebert. Prentice Hall International, 68 Wood Lane End, Hemel Hempstead, HP2 4RG. 385 pp. 68.

THIS book is not for those who have already read Kiebert's earlier volumes based on Algol W and PL/I or those who might expect to learn Pascal from this one.

The material is essentially the same and the series might almost have been generated by a macro processor. Had it been so, many irritating typographical errors would have been avoided.

According to the preface, the programming language is incidental to the main theme and there are few "digressions on the details of usage" of Pascal.

There are chapters on most of the topics one would expect in a work on structured programming, but the ordering and emphasis do not always seem quite right.

For instance, compound statements are introduced not in the context of abstraction but as a synthetic requirement of conditional statements.

A "disproportionate coverage is given to arrays, yet the treatment of records is meagre. Pointers are not discussed at all."

The greatest value lies in the many worked examples. However, many of these will appeal mainly to computer science students who tend to be more mathematically oriented than computing practitioners: a large.

The value of the many exercises and "self-check" questions is greatly diminished by the absence of solutions.

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